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PATHOLOGY OF TUBERCULOSIS

H. G. JETER, M.D.
OKLAHOMA CITY

Introduction—

The pathology of tuberculosis has been a subject of very great interest to medical philosophers for many years. It was known in all its forms long before the discovery of its causative agent by R. Koch in 1882. The name, tuberculosis, refers to the characteristic lesion, the tubercle, which means literally, in the Latin, a small swelling. Dr. Gross in his most excellent text book of Pathological Anatomy, published in 1845, describes in detail the lesions of tuberculosis and the incidence in different organs of the body. These observations, as he states, "were founded on careful autopsy inspection. Many of his contemporaries, both in Europe and America, made similar observations, and most of the authorities of the nineteenth century seemed to agree that they were dealing with a contagious disease. However, it is interesting to note that Dr. Gross enumerated the many opinions of pathologists respecting the nature of the tubercle and accepted the doctrine of inflammatory origin. Among the opinions considered was one of Dr. Baron, an eminent English physician, that the tubercles were real products of "animalicules". But this view was disregarded as "not even plausible" and "unworthy of further notice". Koch, about forty years later, succeeded in first demonstrating the bacillus tuberculosis; in securing pure cultures of the bacillus and in perfecting successful animal inoculation experiments. So, today we can consider the pathology of tuberculosis with two great fundamental facts in mind, namely, that it is an inflammatory disease and that the bacillus is a specific etiological agent.

Inflammation. What is inflammation? It is the reaction to an injury or the response of the tissue of the body to micro-organisms, a chemical, trauma or a combination of one or more of these agents. There is a more or less specific response for each different type of injury depending upon the injurious agent. For example: Peyer's patch produced by the bacillus typhosus, the gumma by the treponema pallida, the boil by the pyogenic micrococcus, the cicatrix by the escharotic, the blister by the burn and so forth.

The Injurious Agent of Tuberculosis. The agent which causes the injury in tuberculosis is a slender, often slightly curved, sometimes branched, rod shaped microorganism. The individual rods may occur singly but often lie in small heaps. Vacuoles are sometimes observed and not infrequently the bacillus has the appearance of a chain of cocci.

The composition of this offending agent differs considerably from most bacterial and recent investigations by Dr. Krause and others seem to indicate that this fundamental fact may account for some of the peculiar lesions which we all know to be common in tuberculosis. We shall assume, then, that as an injurious agent, responsible for this disease, bacillus tuberculosis is a microorganism composed of wax or fat and protein. The waxy capsule probably explains its staining characteristics of retaining certain stains even when washed in acid. We shall refer to the protein later in consnderation of the allergic reaction.

Avenues of Infection. The reaction to infection in tuberculosis brings us to a gross and histologic lesion, the tubercle. If we accept the definition of infection as being the invasion of microorganism beyond the normal barriers of the body, we should bear in mind the ever present question: What barriers are let down, or, in other words, what are the avenues of infection? Time does not permit to discuss the many theories in this connection. However, it seems certain that the organisms may enter by way of the upper respiratory tract, the gastro intestinal tract, the skin, the genitals, or other parts, and that having passed the barriers they are transmitted by means of the lymphatic system, the blood

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streams or by continuity of tissue. Experiments show that there is a variety of focalization in different animals, regardless of the portal of entry. The incidence is high in the lymphatic system in all animals, especially high in the spleen of the guinea pig and the lungs of the human. It seems generally agreed that focalization is accomplished by the lymph glands.

Reaction. The reaction may be said to be of two general types, nodular and non-nodular.

Nodular. This refers to the typical lesion of tuberculosis, the tubercle. What is a tubercle? It is a small swelling which appears as the native response to the tubercle bacillus. Histologically it is composed of lymphocytes, so called epithelial cells, fibrinous exudate, fibroblasts and usually but not always, the giant cells of Langerhan's. These are arranged in characteristic manner with the bacillus of tuberculosis and giant cells in or near the centre. The epithelial cells are arranged radically about the center and the lymphocytes scattered around the periphery in a manner to form an outer wall. Sooner or later there occurs a characteristic caseation and necrosis of the centre. From this microscopic sized or miliary lesion we may have the formation of larger or conglomerate masses simply by the union of many tiny lesions.

There is considerable disagreement at the present time as to the derivation of the ephitheliod cells. It is agreed that it is not an epithelial cell. It has been called an endothelial cell, histiocyte, reticular cell, fibroblast, monocyte, reticulo-endothelial cell, etc. Dr. Krause, who has done much investigation along this line recently, concludes that the tubercle is a proliferative process and that the epitheliod cells are pre-existing cells in the tissue where the bacillus of tuberculosis happen to localize and that in response to injury, take on the characteristics of epithelial cells. To me such a theory seems to defy the laws of inflammation but is worthy of serious consideration because of the extensive investigation Dr. Krause has done.

There is always an infiltration or proliferation of fibroblasts at the periphery extending inward and in the healed tubercle a dense mass of fibroblasts remains, if ulceration or calcification has not taken place.

Let us then agree that the primary response to the injury is the tubercle either single or conglomerate and that the termination of this lesion is either ulceration, fibrosis, calcification or a combination of these processes. Whether ulceration, fibrosis or calcification occurs seems to depend upon the dosage (number of bacteria), organ affected and the degree or natural resistance of the body.

Non Nodular. This is the reaction which follows the nodular type and the tissue response is that of acute inflammation characterized usually by swelling (tumor), pain (dolor), redness (rubor), heat (calor), and partial loss of function. In this group falls the tuberculous pneumonia, pleural and peritoneal effusions, meningeal and articular exudates, etc. Krause and others by extensive experimentation have advanced good reason to suppose that this stage of reactivity is the allergic reaction or the response to dissociation of the proteins of the tubercle bacilli (tuberculin). There is also much evidence that the necrosis and fibrosis, which is so characteristic, is the direct result of the local effect of this highly poisonous substance. The tubercle, he suggests is the response to the fat or waxy portion of the bacilli.

Next, I shall mention briefly, some of the special forms of tuberculosis.

Miliary Tuberculosis. This is doubtless the result of an enormous dose of bacilli getting into the blood stream and, thereby, resulting in thousands of minute millet seed-like tubercles or nodules. This is usually the result of the rupture of some focus where necrosis has extended into a blood vessel because of the lack of sufficient local resistance or perhaps the peculiar localization near a fair sized vessel. It is also considered that the same may occur especially in children when a large number of bacilli first enter the body. There is no reason why several such crops should not successively be set free. We have histological evidence that such does occur and thus the number of bacilli may increase by geometrical progression as do also the number of tubercules. Death, as you know, is the usual result and the severe systemic symptoms are probably due to the combination of tubercle and allergic response. The distribution of bacilli is general but certain tissues such as the skin, thyroid, pancreas and muscle usually, but not always, escape. The spleen, liver, lungs, kidneys and serous surfaces usually are affected. The lesions may be easily seen with the opthalmoscope in the choroid of the eye.

Upper Respiratory Tract. The nose and pharynx may be infected by inhalation or direct inoculation from finger or handkerchiefs. Recently, I have examined tuberculous tonsils from a chronic case with a localized lesion of the hip. Routine examination of tonsils, in my experience, has shown only occasional (about 1%) involvement. Ulceration is the rule if the mucus membrane is affected. Tubercles are formed just beneath the epithelium and when necrosis occurs, ulceration is the result. Tuberculous ulceration of the larynx is common and is no doubt usually due to the passage of sputum in advanced pulmonary infections with cavitation.

Tuberculosis of the Lungs. For centuries it has been recognized that the most advanced lesions are at the apex and that the disease progresses downward, usually more rapidly in one lung. The most common site is about one and one-half inches below the summit of the lung in the upper lobe and corresponds to a spot just below the clavicle. The next most common site of primary lesion is the first and second anterior interspaces. There are many forms of tuberculosis of the lungs:

1. *Miliary.* The lesions are very numerous and generally in air cells or terminal bronchioles.

2. *Broncho-Pneumonia.* In a large proportion of the chronic tuberculosis of the lungs the terminal bronchioles are involved and that region, therefore, blocked by products of caseation and the result is:

(a) *Ulceration* — if necrosis occurs rapidly in the wall of the bronchiole, and a small cavity may result.

(b) *Fibrosis*—occurs if the process is more chronic. This represents the healing of the tubercles and may be any degree of density or even often becomes calcified.

(c) *Cavitation* — the small cavities are ragged and irregular in outline and contain the caseated products of inflammation and usually numerous bacilli. The process extends by contiguity of tissue and the greater part of the upper lobe may be occupied by one or more cavities. If by continuity of tissue, along the bronchi, bronchiectasis is the result; if a cavity ruptures into the pleural sac, a pneumothorax results; if into a blood vessel, hemoptysis results. A majority of the cavities in chronic cases have well defined walls composed of fibrous tissue and leukocytes, but even these cavities have a tendency to increase in size. The pleura is involved in practically all cases of pulmonary tuberculosis. This may result in thickening of the pleura, either serous, purulent or hemorrhagic, effusions or adhesions which occur in nearly all cases. Bronchial and peribronchial lymph glands are involved in most of the acute cases. This is especially true in children.

Gastro Intestinal Tract. This is a rare form except in children. Occasionally it is seen in adults but is doubtless nearly always secondary. The tubercles are seen first in the lymph follicles but later caseate and form ulcers of the muscosa. The lesions occur most frequently in the distal portion but not infrequently numerous higher up in the tract and in the colon. The ulcers have a tendency to encircle the gut. The margin is ragged, nodular, irregular and undermined. The bacilli are evidently absorbed into the lymph channels in which situation they cause obstruction causing the lymphatics to become conspicuous. The mesenteric glands sooner or later receive the infection and show tubercle formation. One or more large masses may form and obstruct the lumen of the gut in a manner to simulate malignancy.

Tuberculous Peritonitis. The types of tuberculous peritonitis seem to depend upon the number and virulence of the organisms. Effusion and chronicity is the rule. Small tubercles are usually scattered over the peritoneum.

Tuberculosis of Pericardium. This is not as common as that of the pleura and peritoneum but perhaps more common than is generally supposed. A small heart and probably an acute atrophy of the myocardium is the general rule in chronic tuberculosis without a pericarditis.

Lymphatics. It is generally agreed that the incidence of tuberculous adenitis is greater than in any other organ, the lungs not excepted. Tuberculosis is to be remembered as a constitutional disease, thought by many to spread by way of lymphatics and whether this be true or not, careful physical examination usually reveals lymphadenitis.

But there is the so called tuberculosis of the lymph glands or scrofula, seemingly a primary disease of the lymphatics with marked swelling of the glands and very little or no involvement of the lungs. The focalization is thought to be in the glands, perhaps through tonsils or some other accessible peripheral glands. Some have suggested that the bacilli are a different strain in this disease. The outstanding features are: (a) A tendency to involvement of a local group, such as the cervicals, the mediastinal or mesenteric. (b) A tendency to spontaneous healing in a great proportion of the cases. (c) Not infrequently, there is suppuration and spontaneous drainage. In this event healing is often prolonged. (d) This form of tuberculosis is very common in children, especially in the colored race. Proliferation, necrosis and calcification is the rule. Calcified mesenteric glands — demonstrable by the X-ray, in children are therefore thought to be especially significant.

Bones and Joints. The infection in this case is thought to be nearly always, if not always, secondary and by way of the blood stream or contiguity of tissue. Traumatism is doubtless an important predisposing factor. The lesions nearly always begin in the bone, but practically never in the shafts. Bone destruction and extension into the cartilage and membranes of the joint is the rule and bone production in the uncomplicated cases with no secondary invaders, is thought by many not to occur. Miliary tubercles form on the surfaces and necrosis leads to extensive excavation into the bone. Fistulae not infrequently result and burrow through the muscles and fascia. A cold abscess may result. Tuberculosis of the spine usually leads to angulation, obliteration of the intervertebral space and destruction of the body of the vertebra. This disease is by far most common in children.

Genito Urinary Tract. It is a debatable question as to how the infection gets to the kidneys but it seems likely that it is by the blood streams and that the kidneys are always secondary to some other focus. This disease begins as numerous tubercles in the cortex and medulla of one or both kidneys followed by necrosis and destruction of the parenchyma, which usually terminates in drainage into the pelvis and hence a pyelitis. The kidney as a result is greatly enlarged but may contract and become atrophic. Consequently the ureter is inflamed by direct extension and the wall becomes thickened, tortuous and irregular. Cystitis is considered by most observers to be always secondary to the tuberculous kidney and a diagnosis of tuberculous cystitis, therefore, means tuberculous involvement of one or more kidneys.

Tuberculosis of the epididymis occasionally occurs but involvement of the testicle or seminal vesicle is rare. Ovaries are also usually exempt but tuberculosis of the fallopian tube is not exceedingly rare.

Meninges. This is a common disease of Children and is thought to be a complication of generalized miliary tuberculosis. In adults the process is always secondary but fortunately comparatively rare. Tubercles first form on the surface of the brain or cord and are followed by perivascular involvement of the meninges. Brain and cord tubercles without meningitis are occasionally observed. The size of such tumors varies from microscopic size to two or three cm. or larger.

Important Laboratory Diagnostic Tests. There are many laboratory tests which are being used as aids in diagnosis of tuberculosis but only a few which seem to be of practical interest for the practitioner today. It goes without saying that in many cases the diagnosis is obvious and it might be said that laboratory confirmation is unnecessary but there is perhaps an equal number of cases, the diagnosis of which is uncertain.

1. *Tubercle Bacilli.* A direct smear from the selected caseous portions of the necrotic and exudative material from a tuberculous lesion, often leads to a conclusive diagnosis. The acid fast stain of carbofuchsin washed by a 2 per cent alcoholic solution of hydrochloric acid or 25 per cent solution of sulphuric acid and counterstained by methylene blue, can be safely done by any capable technician or doctor in a few minutes' time. Many methods of concentration are recommended. In our hands the method of using an aqueous solution of 2 per cent sodium carbonate and 2 per cent phenol to digest the mucus, deoderize and sterilize the specimen, seems the most satisfactory. It has the advantage that all bacteria are concentrated and the predominating microorganisms can be determined, as well as the tubercle bacilli. I believe it the duty of every physician to make repeated tests for the acid-fast bacilli and tell the patient what is found. Repeated negative sputa in pulmonary tuberculosis, I believe, should make the diagnosis very

uncertain and the complete record of the case should be reviewed again. I am sure each of you have had patients tell you of having had tuberculosis elsewhere and under the care of another physician. No greater assurance of a correct diagnosis having been made, could be given you by that patient than for him to say that his doctor had previously examined the sputum and found the germ of tuberculosis.

2. *X-Ray examinations* need only to be mentioned by way of saying that if the characteristic lesions as described above are demonstrated, the diagnosis is substantially established and furthermore a record is made which in some cases is invaluable in determining the progress of the disease.

3. *Tuberculin Tests.* By the tuberculin test we refer to a test of the tissue reactivity to the dissociated protein of the pure culture of bacilli of tuberculous. It is convenient to speak of this substance as an endotoxin since it is only obtained through the destruction of the bacteria and not simply present in the liquid in which the culture is grown. It is also of practical importance to remember that the various methods of standardization are used by different biological houses. (Tuberculin—A Report of a Conference on its Standardization—Am. Review of Tuberculosis, July, 1926.) Any form of tuberculin reaction indicates tuberculous infection but the different forms give different information. It is specific to the extent that a very small amount of tuberculin produces it in tuberculous tissue but no amount of tuberculin will produce it in non-tuberculous tissue. The intense general reaction in advanced cases is due to the presence of large amounts of tuberculous tissue with a great tendency to break down and set free the toxin. Favorable and cured cases show slight general reaction. The local reaction only shows that tuberculous infection has taken place, it gives no information as to the site, extent or degree. It is interesting to note that the weak reaction in progressive processes are not capable of being increased by a second tuberculin injection, while in cases that are in process of healing, the reactive capacity is increased and the second injection gives a much stronger reaction than the first. The general rule is that severe cases show a strong general and a slight local reaction; benign cases show a moderate general, but as a rule, a strong local; while inactive cases show a slight general reaction and also a slight local reaction which, however, is capable of being increased.

There are many methods of procedure in making the test. The Von Pirquet test seems to have proven to be the simplest and as efficient as any. Although some prefer the intradermal method. The forearm is usually selected for convenience, and two areas scarified and exposed to the tuberculin. A control should always be made. Dr. Stewart, professor of pediatrics, University of Minnesota, recently reports a very simple puncture method, whereby a drop of tuberculin is placed on the skin and a simple puncture made through the drop and into the skin. This procedure gave 100 per cent positive in 223 cases, as compared with the old scarification method.

There are in my mind doubtless many cases which are clinically borderline as to diagnosis, in which the tuberculin test can be used to advantage.

4. *Biopsy.* It goes without saying that the prognosis and treatment of glandular enlargements depends much upon the early diagnosis. In my experience about two out of three histological examinations from cases suspected of neoplasia involving the lymph glands, have resulted in a diagnosis of tuberculosis. It is to be remembered that glandular tuberculosis very often does not give the usual chest findings and characteristic points in the history.

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EARLY TUBERCULOSIS OF THE KIDNEY*

C. B. TAYLOR, M.D.
OKLAHOMA CITY

It is quite generally conceded that tuberculosis is not primary in the kidney. Quite often, however, it is not possible to demonstrate tuberculosis anywhere else in the

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body when a kidney is definitely infected. That the infection is carried by the blood stream is also generally accepted.

Except in miliary tuberculosis one kidney alone is involved in the infection for a considerable while before the opposite one is affected. The first part of the kidney to be involved is the tip of the papilla in the vast majority of cases.

The diagnosis can only be positively made by the finding of the tubercle bacilli. In some instances this is comparatively easy. In others the greatest difficulty is encountered. The history and a general examination are of the greatest importance. Exposure to tuberculosis in early childhood is very significant. The presence of tubercular foci elsewhere in the body is of importance. The most common symptoms in order of their frequency are frequency of urination, dysuria and hematuria. Quite commonly one of these appear as the only manifestation; at times two of them; not rarely all three are present. Pain over the kidney is present either in conjunction with the above mentioned symptoms or alone.

Since there is but one treatment for a tubercular kidney it is manifestly mandatory that the diagnosis be correct and that the proper kidney be convicted. This can only be done by a urological examination in conjunction with the laboratory.

I intend to deal in this paper only with early tuberculosis of the kidney. The diagnosis is much easier and much more certain after the ureters and bladder are involved. Then the characteristic lesions around the ureteral opening point a clear way.

An examination to be complete must include both kidneys. It is manifestly unwise to remove one kidney until we know that the other is able to carry on. In beginning tuberculosis of the kidney the lesions are slight. A pyelogram, even in early cases is often suggestive. There is a clubbing of the calyces which is significant, but not diagnostic. Before a pyelogram is made catheterized specimens from each kidney are obtained. At the same sitting the efficiency of each kidney is determined by a dye test. Either indigo-carmine or pheno-sulpho-phthalein may be used. Usually the affected side shows a dimunition in the dye output. At the same sitting the status of the well kidney is ascertained should nephrectomy be necessary. The separate specimens should be examined microscopically and by culture. Occasionally the tubercle bacilli can be found in the centrifugalized specimen. When these are found in the presence of pus cells the diagnosis is clear. Usually, however, a guinea pig inoculation is necessary. This has its drawbacks as from six to eight weeks must elapse before the pigs are killed.

Dr. Joseph V. Mandel of Bruenn, Austria, has an interesting and instructive article describing a culture medium of glycerin-potato which he claimed shortens the period of diagnosis very materially. We have not been using this in our clinic. He makes claim for it that it is more accurate than the guinea pig test and is time saving.

Since this paper is to be followed by papers by an internist and a general surgeon I have purposely dealt just with essentials in the diagnosis without attempting to describe in detail the procedure of catheterizing the ureters, pyelographic medium used, laboratory technic, etc.

PROGNOSIS OF TUBERCULOSIS*

C. E. BATES, M.D.
OKLAHOMA CITY

By prognosis is meant a forecast of the course and termination of a disease, an outlook afforded by such a forecast, an indication of the future by signs and symptoms.

Although the disease may have existed for some time, the battle is just begun when a diagnosis of active tuberculosis is made. How long will the patient be disabled? What plans can he make for the future? Is recovery probable or possible? Tuberculosis was once considered an incurable disease. Today it is considered the most curable of all chronic diseases and is curable in all stages. In the past twenty years the death rate has been reduced from over 200 per hundred thousand to less than 100 per hundred thousand.

It is true that the prognosis depends upon the dose of infection, the virulence of the infection and the resistance of the individual, but in a broader sense it depends upon certain principles of immunity, the extent and form of the disease, the age, the onset, the signs and symptoms, complications, the character and economic condi-

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tion of the patient and the advice and treatment given by those responsible for his care.

Extent. In approximate figures, 75 per cent of the early cases recover; 50 per cent of those who are moderately advanced may be returned to earning capacity and 25 per cent of the far advanced may be restored to partial or full earning capacity. J. Edward Squires in a report of over 2,000 cases gives the following table:

One lobe involved, 87 per cent arrested; two lobes involved, 72 per cent arrested; three lobes involved, 58 per cent arrested, and four lobes involved, 44 per cent arrested.

Form. In the acute pneumonic form the prognosis is bad. It usually means an old chronic form "gone wild" and the defensive powers have little time to limit the action. In the miliary form a few cases have been reported cured but the prognosis is unfavorable because there is a massive systemic infection in which the tubercle bacilli are in the blood stream and may set up activity in other tissues as well as the lungs. In the fibroid and fibro-caseous forms, the forms usually encountered, the prognosis is favorable.

Age. The younger the child the worse the outlook. Under six months the prognosis is bad. It is estimated that in the cities 10 per cent of the children under one year of age are tuberculous. In a study of a large group of children whose parents had open tuberculosis, i.e., tubercle bacilli in the sputum, it was found that 84 per cent died by the third year. In a similar number who had the infection but were not exposed to open disease the mortality was 33 per cent. Frequent massive infection is fatal while those receiving infection in a more casual or incidental way from outside sources develop a surprising amount of resistance. Tuberculosis runs a milder course in the aged but is less apt to become arrested than in the young or middle aged.

Onset. A sudden onset means no resistance and a bad prognosis. Races that have been exposed to the disease for many generations have a much higher resistance than those exposed for the first time. For example, the Jewish race are more resistant than the American Indian or the negro. In China conditions are favorable for the spread of tuberculosis and the disease is almost universal but the death rate is extremely low. Acute tuberculosis is rare. One of the South Sea Islands was almost depopulated in two years when the infection was introduced for the first time by English Colonists. It is generally believed that in an adult having the infection for the first time a favorable outcome is not so certain.

Along this line it might be interesting to note that Professor Calmette of the Pasteur Institute has vaccinated over fifty thousand children at birth with a very weak strain of tubercle bacilli and claims to have noted a very marked reduction in the mortality.

Signs and Symptoms. Patients beginning with sudden hemorrhage need not feel so gloomy. A very small per cent die of hemorrhage and if there is anything that impresses him with the diagnosis and the necessity for treatment it is this dramatic experience. Statistics show almost as many cures among those who have hemorrhage as among those who do not. The weight or gain in weight has little to do with prognosis. The prognosis is unfavorable in direct ratio to the height and duration of fever. A reversed type, that is high in the morning and lower in the afternoon is bad. A persistent rapid resting pulse is an unfavorable sign. It has been said that a patient who eats well and sleeps well will recover. Low blood pressure, systolic below 100, indicates poor heart action from toxemia and is not a good sign. A positive sputum influences the prognosis considerably. At the Trudeau Sanatorium, Saranac Lake, 1,000 cases were studied. Among those with positive sputum the mortality was 32 per cent. While among those with negative sputum the mortality was 6 per cent. When the symptoms are out of proportion to the signs the prognosis is bad. Lesions on the left side heal more slowly than the right, probably because of the tugging action of the heart. Tuberculous lesions at the base heal slowly because of the greater mobility of that part. A patient showing a well defined line of demarcation between normal and affected parts has a better prognosis than one showing gradual change from normal to pathological lung tissue.

The danger of cavitation varies inversely with the time it takes to produce them. The statement has been made that cavitation indicates immunity. This may be true, but when a large conglomerate tubercle becomes necrosed and excavitated, a cavity is left and it can hardly be taken as a good sign. It forms a potential source of

hemorrhage and its walls afford good culture media for the tubercle bacilli. We frequently see cases with large cavities with low toxemia, but they rarely become arrested without compression of the affected side.

The blood count often gives valuable aid in determining the prognosis. A high lymphocyte count with relative low poly count means better resistance than a leucocytosis with a high poly count because the latter indicates extensive secondary infection.

Complications. The final outcome may be determined by the complications. Tuberculosis of the throat, intestines, meninges and kidneys have a grave prognosis. The prognosis of intestinal tuberculosis is about what the prognosis of consumption was fifty years ago, and for the same reason—that the only stage under observation is the far advanced. Empyema is a bad complication. Spontaneous pneumothorax has a high mortality, though not as high as formerly believed. Accidental infections such as influenza and pneumonia may reactivate old healed lesions and lay down the barier for new invasion and change the prognosis from favorable to unfavorable. Tuberculosis of the bones and joints usually yields to proper treatment. This condition is frequently seen with no activity in the lung. The extra pulmonary focus may increase the resistance to the infection or it may be that the enforced rest promotes healing within the lung. Body casts applied for caries of the spine causes limited motion of the chest, shallow breathing and offers favorable conditions for arrest of pulmonary lesions.

An important factor in determining the final result is the family physician or the physician who makes the diagnosis. This is especially true in the light of present special measures of treatment, one of the most important of which is collapse therapy. Success or failure depends upon a thorough study of the case, proper evaluation of the signs and symptoms and extent of the pathology and the ability to recognize the indications or contra-indications for certain special forms of treatment. For example, a patient with active tuberculosis in the lungs and larynx who takes sun treatment or goes to the physician's office for ultra violet ray exposures or throat treatments has a very poor chance for recovery. On the other hand, failure to collapse a lung showing rapid invasion with cavity formation when the contralateral lung is in good or fair condition may change the prognosis from favorable to unfavorable. The patient is depressed and apprehensive and in a receptive mood and it rests with the physician to give him the proper attitude toward the disease. He can help him conserve his finances by discouraging "selling out and going West." The keynote to climate is wisdom. If hospitalization can not be accepted he can be impressed with the importance of rest at home and he can be given the assurance that tuberculosis is curable.

Last, but not least, is the character of the patient. It requires character to forego business, friends and pleasures, and adopt the rather dull routine of rest in bed and continue it persistently and consistently. It seems that the curability of a patient is in direct proportion to his intelligence. The average individual makes about the same success at *chasing the cure* that he did in private life. To succeed at getting well and staying well he must study the disease from observation and from books written for the laity. He must learn that an important symptom which guides his activities is *fatigue* and he must learn to live within his limitations.

The prognosis is invariably better if he can have a period of hospitalization where he can gain a general knowledge of the disease and learn the meaning of acquiescence, cooperation and adaptability.

NOTE—I have not included bibliography; it is very extensive, and I have consulted it frequently.

TUBERCULOSIS OF THE KIDNEY*

PHILIP M. MCNEILL, M.D.
OKLAHOMA CITY

Medical Treatment—

Tuberculosis of the kidney is relatively rare in this section of the country. During the last ten years there have been very few case in the University and St. Anthony's Hospital, and yet observers elsewhere seem to have quite a number of these cases. We see as much pulmonary T. B. in proportion, but for some reason, genito-urinary T. B. is infrequent.

To have a better understanding of this disease we must consider the pathology. As you know, the kidney is infected always secondary to tuberculosis elsewhere in the body and renal involvement

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takes place by the hematogenous route in most cases, by direct extension from surrounding tissues occasionally, and by the lymphatics very rarely, due to the fact that the lymph flows away from the kidney rather than toward it.

The organism being practically always blood borne, lodge in the kidneys at a place where the blood pressure is the least, which is near the cortex and near the upper pole. Here the same reaction takes place that occurs any time T. B. enters the body. Nature throws up a wall of connective tissue around the organisms trying to wall them off. That she is successful in some cases is shown by the healing areas found in persons who die of other causes, and the lesions are found post-mortem. If the disease overcomes the defending barrier, caseation takes place. From the location of the lesion in the kidney, the symptomotology develops. If the lesion is near the cortical layer, rupture occurs into the perirenal tissues. This may or may not cause symptoms. If near the pelvis, necrosis with rupture will cause a sudden shower of pus in the urine, accompanied by blood in about 25 per cent of the cases. If undetected or untreated, infection of the entire pelvis may take place by direct extension, causing an obliteration of the ureter with resulting soft or putty-like kidney. Or, if in the parenchyma, a gradual involvement of all the pyramids may take place causing the same condition.

The symptoms usually referable to T. B. kidney are those of cystitis, which is always secondary, but is usually the symptoms that cause the patient to consult his physician.

As this paper deals entirely with medical treatment, we must stay within our subject, but there is one point in diagnosis that should be stressed — namely, acid pyuria, without the amoniacal odor, must always be investigated with reference to T. B. This is one of the old points in diagnosis and yet the average physician must have his attention attracted forcefully to it or he will overlook it. For it is the family physician who sees these cases early, not the urologist nor the physiotherapist.

The treatment of T. B. of the kidney is two-fold, namely, medical and surgical, and neither can be separated from the other. All unilateral involvements should be operated early, removing the kidney, but in addition to this, the patient must have careful medical supervision until he is back to normal. In bilateral disease, the treatment is always medical, and it makes no difference how far advanced these cases are not ever considered hopeless. It is true that bilateral involvement of the kidneys is far more serious than bilateral pulmonary involvement, but who of us is so expert on prognosis that he can tell which will survive?

As with tuberculosis elsewhere, the first essential is to treat the patient and the pathology will improve in a majority of instances. How familiar you are with the fundamental treatment: Rest! Of all therapeutic measures, it is by far the most indispensable. Before operation as a preliminary step, it has no equal. Rest in bed, lessening the metabolism, slowing the circulation, decreasing the amount of blood forced through the kidney, lessening toxemia and prevention of spread of the disease—these things are accomplished. After operation or in bilateral cases, from the onset rest must be continued until the patient is temperature free for a month. Then graduated exercise with modified rest plan, depending upon the individual case, until recovery has taken place. The patient also must be free from mental or financial worries. The nutrition of the patient must be kept at the highest point. His diet must consist of good wholesome food, well cooked and served in an appetizing way. Three good meals a day of balanced diet, rather than the old treatment of forced feeding on sweet milk and raw eggs. Especially is diet important in renal T. B. because forced feedings are not as easily tolerated as it would be in other forms of T. B. Fresh air is important—why? Because usually the renal involvement is secondary to T. B. of the lungs, and also it promotes the general vigor and healthfulness of the patient.

There is very little place for drugs in this form of the disease. Urinary antiseptics are not tolerated, useless, and sometimes detrimental. Water, freely taken is the drug par excellence. When the cystitis is severe in unoperated cases, it has to be relieved at times by anodynes or codeine.

In all cases specific therapy is indicated. This is given in form of bacilli emulsions or old tuberculins. It is best to start with very small doses, usually .000,000,1 cc. to .000,001 cc. and continue at intervals of three to four days, increasing the dosage gradually until a reaction occurs. These

reactions may be focal or general. If there is a general reaction with fever, malaise, anorexia, it is usually best to wait a week and then begin with half of the reaction dose, and ascend very cautiously. The best results are obtained from the maximum dose that stays just below the reaction point. This treatment must be maintained for several months.

In addition to specific therapy in recent years, light treatment has been used advantageously. This is applicable to all forms of T. B. except pulmonary. Sunlight, if administered properly, is a very useful adjunct. But the dosage of light must be very small at first, gradually ascending as the patient becomes more accustomed to it. A very good way to institute light therapy is to expose from the feet to the knees for five minutes the first day, from the knees to the hips five minutes the second day, and knees down, ten minutes, etc., until the body is thoroughly exposed for one hour, both front and back. If febrile reactions occur, the amount of exposure must be reduced and gradually built up again. Ultra violet light may be used in lieu of sun treatment.

In closing, we wish to say that it is always the patient to be treated; that usually there is T. B. present elsewhere in the body which must be cared for; and that in the problem of treatment the medical management is of the greatest importance.

THE TREATMENT OF PULMONARY TUBERCULOSIS WITH SPECIAL REFERENCE TO SURGICAL COLLAPSE*

L. J. MOORMAN, M.D.
OKLAHOMA CITY

In all discussions of the tuberculosis problem it has been customary to place the chief emphasis upon diagnosis, especially early diagnosis. This practice is justified by two main reasons: (1) an early diagnosis gives the best chance for recovery; (2) an early diagnosis in a case which responds to treatment materially lessons the danger to others.

Under present methods of treatment these rules still hold and should be religiously applied, but in the process of therapeutic evolution, a ray of light has penetrated the age long darkness which enveloped the couch of the advanced consumptive, even the bedridden cases' "with coughs decayed" are entitled to an exhaustive study with a view of determining whether or not they may be benefited by the application of collapse therapy in some one of its forms. In many cases such a study calls for long continued observation, preferably in a sanatorium where frequent examinations may be conducted, and' "fine discrimination employed with reference to the relative condition of the two lungs, the character and comparative age of lesions, degree of activity, and so forth."

The hope that such a study offers, makes institutional life acceptable to these otherwise hopeless cases, and their removal from the home greatly reduces the danger to other members of the family. In the average case, whether treated in the home or sanatorium, we still rely upon the established routine measures: rest, food and fresh air, with emphasis upon rest. This sounds simple, but there are many important factors, for some cases—even determining factors, which cannot be discussed in the time allotted for this paper. Suffice it to say that the progress of the case from week to week should determine the treatment, with necessary variations to meet individual needs.

Intelligent direction of a case requires a close study of symptoms, and a careful interpretation of physical signs. With these facts in mind it is evident that the sanatorium plan supplies many advantages which are not to be had in the home, and finally, the education of the patient which is so essential, can hardly be accomplished outside the sanatorium.

In the course of time patients who do not respond to these routine measures, even minimal and moderately advanced cases, must come under consideration with reference to artificial pneumothorax or collapse by means of the introduction of air in the pleural space. In well chosen cases, this method of treatment restores earning capacity in about 35 per cent and leads to improvement in an additional 35 per cent. Indications, contraindications, and methods of procedure, cannot be discussed for want of space. In a certain number of cases this method cannot be successfully employed because of pleural adhesions. In spite of such failure, the indications are still clearly in favor of collapse, and it is in just such cases as these that extra-pleural thoracoplasty skillfully employed in the course of well managed

*Read before the Section on Neurology, Pathology and Bacteriology, Annual Meeting of Oklahoma State Medical Association, Tulsa, May, 1928.

cases, may offer results comparable to those secured by the successful employment of artificial pneumothorax. Dr. Horace Reed has wisely said that thoracoplasty is only a coincidence in the course of treatment, and should be done only after consultation with the phthisistherapeutist who has observed the case for months, and who will have the responsibility of continuing to direct the care for many months after the operation.

The following pictures, with accompaning case reports, have been selected as fairly representative of the results obtained by artificial pneumothorax and thoracoplasty. All are sanatorium cases. Thoracoplasty cases were transferred to a general hospitail for operation, and returned to the sanatorium within two to four weeks after operation.

FIGURE No. 1.

This represents a very common type. Advanced chronic ulcerative pulmonary tuberculosis with a large cavity in the upper lobe of the left lung. The cavity is held open by pleural adhesions and dense cavity walls. The lung had been partially collapsed for more than a year when the first picture was taken. It is possible to see the outline of both upper and lower lobes partially collapsed, the upper extending like a tennis racquet to include the large cavity. More frequent fillings with gradually increasing pressure soon obliterated the cavity as may be seen by inspection of the second picture taken more than eighteen months later. This patient now has an interval of about six weeks between fillings and has been working for the past three years. In this case artificial pneumothorax was employed as a last resort after two years of progressive trouble culminating in cavity formation and profuse pulmonary hemorrhages.

FIGURE No. 2.

A young woman who developed high fever with cough and expectoration. In a few weeks it was possible to demonstrate a cavity in the upper lobe of the right lung and tubercle bacilli were found in the sputum. When she entered the sanatorium the cavity was shown by X-ray as may be seen in the first film. There was also evidence of trouble about the root of the left lung. After a few weeks' observation artificial pneumothorax was advised. Six months later, as may be seen by inspection of the second film, the cavity was completely closed, cough and sputum had practically disappeared and no tubercle bacilli were found. She has been at home with her famiy for more than a year, but comes for fillings at regular intervals.

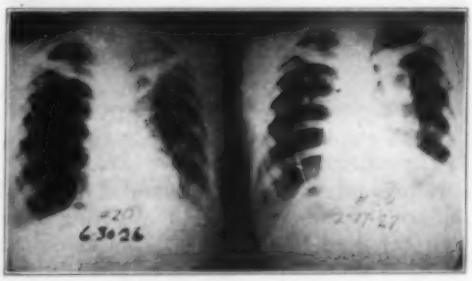

FIGURE No. 3.

This is a case of a young woman who had had the right lung collapsed two years before she entered the Farm Sanatorium. Upon admission examination revealed a partially collapsed right lung in fairly good condition. The upper lobe of left lung showed moderately advanced trouble which seemed to be quiescent. Since she had to work we permitted her to do part time duty as a practical nurse. An attack of "flu" flared the lesion in the left lung causing progressive trouble with cavity formation. The right lung was permitted to expand to some extent and the left one

compressed. Cavities may be seen in the upper lobe of the partially collapsed left lung. This is a beautiful example of bilateral pneumothorax. A more recent picture shows the left lung more completely collapsed with obliteration of the cavities and the right almost fully expanded. The patient is again working part time. If the right lung remains clear under the restored function and the left can be kept in a state of collapse for an indefinite period of time there may be a complete restoration of health.

FIGURE NO. 4.

Represents a case of advanced bilateral pulmonary tuberculosis in a young man who came to the Cottage Sanatorium in 1923. This picture was made after he had been under treatment about three years. The right lung has healed and the left shows considerable infiltration in the uncollapsed portion of the upper lobe. There is a small pneumothorax area immediately above the fluid level which is to be seen on the left at about the third costal cartilage. This is due to a tuberculous empyema which has been carried for a number of years.

Soon after this young man entered the sanatorium we were comtemplating the advisability of attempting artificial pneumothorax on the left side. The case was considered a grave one because of so advanced trouble in both lungs. However, the disease in the left seemed to be more progressive and more active. While we were still debating the advisability of collapse therapy he had a hard coughing spell and developed a spontaneous pneumothorax on the left with sudden collapse of the left lung and spilling of infectious material into the pleural sac, causing all the symptoms of profund shock with marked dyspnea due to the rapid production of fluid and high air pressure as a result of the valve-like rent which permitted the constant pumping of air into the pleural space. After a stormy period, during which we had to relieve the pressure by frequent withdrawals of air and fluid he settled down to the usual course of an artificial pneumothorax case. The toxemia subsided, the lungs healed and after a number of months he returned to his work. After working about a year, while on one of his trips to Oklahoma City for a filling, he was in a wreck and his back slightly injured. He continued to work without symptoms of toxemia, and consequently gave little thought to the injury in spite of the fact he occasionally had pain in his back.

Several months later a lump appeared in the right inguinal region. Examination revealed a cold abscess. An X-ray of the spine showed partial destruction of the fifth lumbar vertebra, with deformity as

FIGURE NO. 5.

shown in the first film in (*Fig. 5*). He was readmitted to the sanatorium and placed on a hard mattress where he remained for eight months. Soon after he was put to bed there was a spontaneous rupture of the cold abscess with free discharge of caseous material for several weeks followed by complete and permanent closure of the sinus. At the end of eight months he was fitted with a light brace and placed on exercise. After a few weeks' observation on exercise he was returned to his former position of time keeper with

an oil company and has been drawing full salary for more than a year. In spite of all he has gone through he is now apparently well.

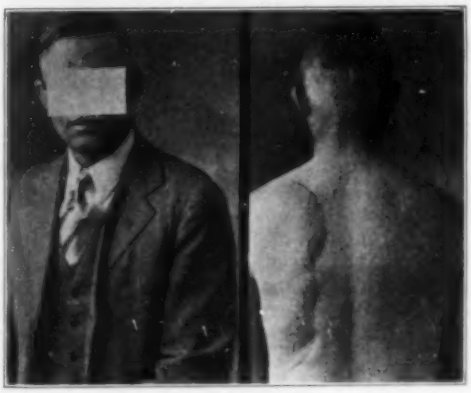

FIGURE NO. 6.

This young man had advanced tuberculosis involving the left lung with cavity in the upper lobe. The right lung was relatively free from disease. The sputum, two to four ounces daily, was loaded with tubercle bacilli. After remaining in the Farm Sanatorium one year without improvement he was advised to have the left lung collapsed. This could not be accomplished by means of artificial pneumothorax because the pleural space was obliterated by adhesions. Thoracoplasty was recommended and by means of a two-stage operation performed by Dr. Horace Reed eleven ribs were removed. This permitted sufficient collapse of the lung to close the cavity and reduce cough and sputum to a minimum in a very short time. The sputum soon became negative and he was able to work part time for six months when he suddenly developed appendicitis. An operation eighteen hours after onset revealed a gangrenous appendix requiring drainage. This led to a temporary flare of the left lung with return of cough, sputum and tubercle bacilli. The sputum was positive only about six weeks. It has been a year since the appendectomy, the patient has been working six months and has practically full earning capacity.

In closing may I urge you to be faithful in the prompt application of the long established routine methods of treatment, and quick to accept the more recent methods which are so full of promise for many otherwise hopeless cases.

1. Dryden.
2. Moorman, Dr. L. J., Tuberculosis in Medical Curicula, Southern Medical Journal, February, 1926.

SURGICAL TREATMENT OF TUBERCULOSIS OF THE KIDNEY*

LEROY LONG, M.D., F.A.C.S.
OKLAHOMA CITY

But one surgical procedure need be considered in connection with tuberculosis of the kidney, and that is the removal of the diseased kidney.

Nephrectomy ought not to be done when there is acute miliary tuberculosis, bilateral kidney infections, or when the patient is not at least a reasonable operative risk.

In acute miliary tuberculosis, the kidney pathology is but a part of general and widely disseminated pathology. The removal of the kidney under such circumstances would be unreasonable and disastrous.

There may be situations in which a kidney in a condition of nephrosis with mixed infection should be removed even though there is evidence of beginning tuberculosis in the opposite kidney, the functional efficiency of which has not been materially reduced. It is a nice point that must receive careful, earnest consideration in the case of the individual patient, and it does not alter the rule that a nephrectomy should be done only when there is but one diseased kidney.

Even though there is no evidence of tuberculosis of the opposite kidney, a nephrectomy should not be undertaken without having first ascertained as nearly as possible the resisting power of the individual. This is particularly true in those cases in which there is remaining function in the diseased kidney. In such a case, the function of the opposite kidney should be carefully investigated in order to try to determine whether or not it will properly take over the additional load after the diseased kidney is removed.

I believe that it is fairly uniformly considered that tuberculosis of the kidney usually begins as a blood-borne infection. The bacilli are deposited in the kidney tissue external to the pelvis, and a focus may exist for a variable length of time without symptoms that cause annoyance enough to send the patient for advice.

The first symptoms leading to justifiable nephrectomy are not always the same. In one case there is dull pain in the kid-

*Read before the Section on Neurology, Pathology and Bacteriology, Annual Meeting of Oklahoma State Medical Association, Tulsa, May, 1926.

ney area, without urinary findings of significance. That is probably due to the direction taken by the pathological process, the advancement being toward the periphery of the kidney. Again, an early symptom may be turbid urine, in which case there has been a communication with the pelvis, either directly or by way of a breach due to disintegration of urinary tubules. Soon after this takes place, there is thamuria. Perhaps the most common early complaints are thamuria and turbid urine. If, in such a case, there are pus cells without pyogenic organisms, and in addition there are acid-fast bacilli, it is reasonable to conclude that the patient has a tuberculosis of the urinary tract; and since tuberculosis of the urinary tract always develops in one kidney, it is fair to conclude that it is a kidney tuberculosis. Catheterization of the ureters will then determine which kidney is involved. and if one kidney only, it ought to be removed.

In but a comparatively few patients with surgical kidneys due to tuberculosis is it possible to palpate the kidney. This is particularly true in the early stage of the disease—the stage in which it would manifestly be very desirable to make the diagnosis. The existence of a tumor that is easily felt generaly means that the condition is late and that there is obstruction to the egress of material from the kidney pelvis.

Thickening of the first part of the ureter with narrowing of its lumen is a familiar picture, and on account of it there may be temporary obstruction from time to time so that nothing for the time being enters the bladder from the diseased kidney. In such a case, the examination of the urine may be misleading. A cystoscopic examination to determine the character of the ureteral openings, and whether urine is coming from both of them, will help to clear up the situation.

While tuberculosis of the kidney is not very common, it is my belief that it is frequently overlooked. I am convinced that a good many of the cases of pyonephrosis were primarily tuberculosis of the kidney. Such errors could be obviated by repeated examination of the urine or guinea pig inoculation.

Beer and others recommend the removal of the entire ureter with the kidney, such an operation necessitating multiple incisions and rather extensive and tedious dissection. I do not believe that such a procedure is necessary, provided the ureter is divided with aseptic precautions and brought through the operative wound so that it does not communicate with the perirenal space.

LARYNGITIS IN THE TUBERCULOUS

FRANK R. VIEREGG, M.D.
CLINTON

This short paper is not intended as a scientific treatise on laryngeal tuberculosis because it is not based on autopsy findings or on any microscopical biopsy findings. It is based on the impressions I gained in doing the every day work of caring for the eye, ear, nose and throat conditions of the patients at the Southwest State Tubercular Sanatorium located at Clinton, during the seven or eight months that I was connected with that institution. It is intended to deal with the general laryngeal conditions that tubercular patients seem so prone to have.

The majority that enter that institution go there as a last resort and are in the advanced stages of pulmonary T. B. So to a large measure the patients that one sees there are not a good sample of what one sees in doing the regular office practice connected with eye, ear, nose and throat work. During the years that I did eye, ear, nose and throat exclusively, and before entering the sanatorium, I saw the average number of these one would see in a fairly large eye, ear, nose and throat practice. I must admit, however, that I got a rather exaggerated idea of the significance of laryngitis in tuberculous patients, for I thought at that time that whenever a tubercular patient develops laryngitis that he was doomed for a sudden demise. That is the impression I get from reading all the standard text books that I have read on this subject.

After having been with the institution for some months I found out that tubercular patients are very susceptible to laryngitis and its resultant hoarseness. The majority of these patients who developed this hoarseness do not have any demonstrable lesions that you could say are due to a localized tubercular process.

We all know that a tubercular patient who develops a tubercular ulcer on their larynx or elsewhere in that neighborhood

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usually soon passes out of the picture—the average being around six months. In the type of condition I am talking about I do not believe that the laryngeal condition is any indication as to what the prognosis will be.

I have seen so many tubercular patients become hoarse who had so slight an involvement of the laryngeal apparatus that at first I thought it impossible that so slight an involvement of the larynx could cause so much a loss of the timbre of the voice. In some of these patients who had lost practically all of their voice and were trying to talk in whispers, on examination of their larynx I would find no ulceration at all and only the very slightest amount of swelling of the posterior end of one of the arytenoid cartilages. This swelling in these cases was very slight and was not accompanied by an appreciable amount of inflammation. What little inflammation there was, was usually limited to the immediate neighborhood of the swelling and had a dull, inactive sort of an appearance. In this type of case the swelling was usually unilateral and was found most often on the posterior end of the arytenoid cartilage. Still harder to locate however were the cases in which the swelling was limited to the region of the thyro-arytenoid joint. In this type of case however the first thing to attract one's attention was the fact that there was a limited movement of one of the arytenoid cartilages.

Most of these patients complained of little except hoarseness. This hoarseness frequently came on rather suddenly and rapidly got worse. If these patients would persist in the use of their voices. Their throat would tire and in some cases they would say that their throat would ache. Most of these patients had no pain on swallowing.

This condition is often very persistent and is quite annoying and unless the patient promptly puts their voice to rest and institutes other remedial measures, to be discussed later on, the hoarseness can become a chronic condition and remain even after the tubercular condition in the chest has apparently healed.

I have observed these patients over a period of six to eight months and I have never seen a one of these cases develop into a true tubercular ulcer.

The characteristic tubercular ulcer is found most often on the posterior end of the arytenoid cartilages. The base of the ulcer is of a dirty yellow color, with the so-called "moth eaten edges." Surrounding these edges is an area of inflammation which is not very intense and has a rather indolent appearance. These ulcers vary in size from the merest dots to involving practically the whole of the larynx. One patient that I have in mind had the entire epiglottis eroded and the surface of both arytenoid cartilages were ulcerated. I often wondered how this man was able to eat at all and why he did not choke on every swallow of water or food that he took. He apparently got by in pretty fair shape. Of course it all was painful to him but he complained less than a great many did who had a much smaller ulcer that was protected by the interposition of the eppiglottis between the ulcer and the food as it passed downward and backward into his oesophagus.

The type of nonulcerated laryngitis that I described above is sometimes found in patients that do not have any tuberculosis at all. I have in mind one patient who has no tuberculosis and to his knowledge never has had tuberculosis, who had exactly the same type of laryngeal trouble that I described above. This man by occupation is an auctioneer and an insurance salesman. If there is any combination of businesses that would make a man an incessant talker it seems to me that that would be it. This fellow had had a series of mishaps or misfortunes or whatever you want to call it that would discourage most of us. Some few years ago he had an operation on his mastoid and was unfortunate enough to have the facial nerve severed. A few years later he went to Mayos where they attempted to make an anastimosis with the spinal accessory, and this was only partially successful. A few years later, after getting back to a heavy schedule of sales, he practically lost his voice and came to me talking in a whisper. I found that he had only about one-fourth of a normal air space in either nasal chamber, due to a highly deflected septum which practically closed both nostrils. In his nose, nasopharynx and throat there was a brilliant inflammation that extended from the end of his nose to the body of the larynx. The larynx did not show any singers' nodules that one would naturally expect to find. The inflammation that was so fiery in his nose and throat did extend to the eppiglottis, but the arytenoid cartilages were grayish in color and slightly edematous and the movement of either of them was somewhat restricted. I had this man's chest thor-

oughly examined for any possible trouble, but it was reported negative. I did a submucous resection and in the course of a short while practicaally all of the inflammation disappeared from his nose and throat. He started back to his old work of crying sales and the old hoarseness returned after he would do any amount of work. On examining his larynx I found that the arytenoid cartilages still had that swollen, grayish appearance. I suggested that he take a few treatments that I am going to describe, for the treatment of this form of laryngitis, and his voice rapidly cleared. He was so encouraged by this that he took quite a few of the treatments and he now tells me that he can give his voice the old-time ring and the hoarseness does not return unless he catches a cold and that is now infrequent.

The treatment of this form of laryngitis and the treatment of true tuberculous laryngitis is very similar to the treatment of T. B. anywhere—namely rest. These patients with the laryngeal involvement should not only give their whole system a rest, but should also give their throat a rest by going on complete silence, which means no whispering either.

For the relief of the pain that these patients suffer there are several things that can be done. Silence which means rest to the larynx, will give a certain small percentage of the patients with true tubercular ulcers sufficient relief to eat. Others with greater involvement will get relief from the topical application of 20 per cent solution of menthol and 10 per cent phenol in glycerin. This applied just prior to meal time permits a great many of these patients to eat in comfort. In still others it takes the insufflation of orthoform powder to get sufficient relief to eat. Orthoform powder is expensive and there are not a great many people who can stand this expense. None of the above mentioned means however have any curative value at all that I was able to detect.

Sunlight reflected into the larynx of these patients by means of this system of metal mirrors gives these patients a sense of warmth, relaxation, and relief from pain that is away beyond what one would naturally expect from such a simple measure. And to see these swellings and areas of inflammation, and even tubercular ulcers themseves grow smaller under the influence of this light one can not doubt that they have some curative action on true tubercular ulcers. The patients themselves say that they have a sense of relief that often lasts throughout the day. It enables them to eat with much more ease and they are most appreciative for all it does for them. It is amusing the way these patients fuss about cloudy weather that keeps them from getting their routine treatments.

Most of these patients, depending upon the degree of their intelligence, soon learn to use these mirrors themselves. It is surprising with what degree of accuracy they can manipulate their tongue and the mirrors to throw the light on the part of their larynx that needs the stimulation most.

So far as my own experience goes this is as far as I have gone in this line of work. Some of the larger institutions in New York go farther I believe. One man by the name of Schugt, reporting in the December, 1927, issue of the Archives of Oto-Laryngology, advocates resection of a portion of the superior laryngeal nerve to produce anaesthesia. He also advocates the injection of the inferior laryngeal nerve with alcohol to produce a temporary paralysis of the larynx. I had considered this procedure in a great many of the patients, but the patients I thought bad enough to warrant either of these procedures were so far gone in a general way that I always felt that these measures would soon prove an unnecessary operation to impose on these severely sick patients. So for that reason I have had no experience with either procedure. From a purely theoretical and anatomical consideration it would seem that either one of them would be ideal. But if in any of these allied conditions you men see fit to give this simple little method a trial I believe that you will be more than paid for your efforts.

In conclusion I might summarize as follows:

1. Tubercular patients are peculiarly susceptible to laryngeal involvements.

2. A large percentage of the laryngeal conditions found in tubercular patients are not due to localized tubercular processes.

3. Non-tuberculous laryngeal conditions found in tuberculous patients has no bearing on the prognosis.

4. Reflected sunlight in these conditions has a curative as well as palliative effect on both the tubercular and non-tubercular laryngeal conditions found in tubercular patients.

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DR. CLAUDE A. THOMPSON.....Editor-in-Chief
Barnes Building, Muskogee, Okla.

DR. P. P. NESBITT.....Associate Editor
Palace Building, Tulsa, Okla.

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EDITORIAL

TO OUR MEMBERSHIP

In a few days each County Secretary will receive advice and plans upon the collection and remittance of dues for 1929. These officers are urged to make these and report them as rapidly as possible in order to get them out of the way and to give time to correct inevitable errors which occur.

Our members will be of great aid to their officers by meeting them half way in this matter. If you wish to help your Secretary, who receives no pay for his services, call him up, ask him the amount of your dues and mail him a check.

Your Secretary feels gratification in advising you that your business affairs are in splendid condition and we feel that the cooperation of our membership will greatly aid in keeping them in this satisfactory state.

TUBERCULOSIS

In this month's Journal there appears much concerning tuberculosis which will bear a great deal of study. This is so large a subject, and has had so much discussion and scientific work, which has not shown results in such a short period of time. The incidence and mortality of tuberculosis has decreased materially in a comparatively few years, which brings about a tale not yet unfolded. There is at the present time, much discussion as to the cause of such a decrease, and as it is not yet decided, satisfactorily, we may say that the factors of hygiene covering food, crowded home conditions, ignorance of health matters, and the decrease in such conditions, together with a decrease in epidemics of debilitating diseases, have had much to do with this change. Other great factors would seem to be the influences of private and public health agencies, and their greater activity, together with a great increase in the number of sanatoria which have greatly benefitted the population by educating them, both before and during the course of the disease. Early diagnosis, however, seems still to be of prime importance, and therefore it is found that much work is being done during the pre-school age in an attempt to avoid close contact. During the following years the same attempt is made, together with a continual survey of those who have been contact cases, during which all known efforts are necessary to bring about a diagnosis, for this is as much a problem as ever, and must be studied from the standpoint of contact, symptoms, repeated physical, sputum, and the X-ray examinations. The treatment has undoubtedly had much to do with reducing the morbidity, and mortality of tuberculosis, and while many cases will do as well, and some better, at home, the majority probably will be better off in a sanatorium. This result is due to both the family and the patient, as the family is thereby removed from contact, and the patient is in close contact with those who understand the disease, and are able to educate the patient so that when he or she leaves the sanatorium, they have a com-

plete knowledge of how to take care of themselves. At the present time there is more thought being given to preventoria for those who have not acquired the disease, and to institutions such as farms and light factory type of work for those who are not able to immediately go into full time labor, and yet do not find it necessary to remain at home or in a sanatorium. The former will undoubtedly prevent very many cases occurring, and the latter will prevent cases of r e c u r r e n c e. While we feel that children especially should be protected, yet there has recently been brought to our attention that there is much suffering of this disease among girls of fifteen and twenty years of age. This is now being carefully studied with a hope of a remedy being found. Treatment of tuberculosis has advanced along with the knowledge of biology and pathology of the disease, and we find as a basic factor that rest is essential. The forms of treatment advocated today such as pneumatic jackets, sand bags, pneumothorax, and thoracoplasty, are but the means of going further with the rest in bed which nature prescribes. Drugs, vaccine and so called serum treatment seem to have a limited value and any new proposition of that kind should be proven by some of our more thoroughly competent research workers and not be taken up in treatment until so proven. Because, while we do not want to be the first to lay the old aside, neither should we be the first to take up with the new.

HORACE T. PRICE,
Member, Committee on Tuberculosis.

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THE MEDICAL RESERVE, NOW A PROBLEM FOR THE YOUNG PROFESSIONAL MEN.

The World War ended more than ten years ago. It has been approximately fourteen years since Mr. Lloyd George, Premier of Great Britian, in summing up the plight of various British services stated that of all of them the medical profession was more nearly ready to function than any other. We all know now how lamentably short this "near prepared" service was found under the great pressure it had to face. None of us have forgotten much of our unpreparedness. After the war, throughout the United States, in every Corps Area, from Corps Area headquarters, was begun organization, enlistment and training of the Organized Medical Reserves. The 8th Corp Area, Col. H. H. Rutherford, Ft. Sam Houston, commanding officer, has seen great advancement in this work and many of the leading medical men in the Area take great pride in the perfection of the Reserves in peace time. As to number the allotment of Reservists in Oklahoma is a matter of pride to the informed of the profession.

Recently it was the writer's privilege to attend a short course in the Commanding Officers' class at Ft Sam Houston, and he is fairly well aware of the situation with reference to the ages of many Reserve Officers, assigned and otherwise. Most of these Reserve Officers are men who saw service more than a decade ago, many of them being at the age where soon they should only be called upon to render certain types of work and that only remotely connected with combat troops. These men of course are growing older and their place must be filled from the ranks of younger men who have no conception whatever of the duties which must be fulfilled by Medical Officers.

It seems to the writer that it should be now the aim and effort of every medical Reserve Officer to bring into training that element of the medical profession which saw no service in the late war. It seems more than likely that the brunt of the next war involving the United States will fall upon medical men of this class.

Much has been said and the opinion is crystalizing throughout the country that in the next war all men, regardless of age and fitness will be called into some service, if the individual can possibly be used. This will probably be the rule, in which case, it will be much better for these younger medical men to take their training annually now, spreading it over a term of years, making it a recreational event rather than to be pressed into service at some future time in a state of unpreparedness.

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Editorial Notes—Personal and General

DR. J. G. BRECO, Ada, is reported seriously ill at Oklahoma City.

DR. HUGH SCOTT, Chicago, spent a few days with friends in Muskogee in November.

DR. and Mrs. J. A. Burnett, Duncan, visited South Texas points in November. Dr. Burnett had a successful hunting trip.

The next annual CLINICAL CONGRESS of the Americal College of Surgeons will be held in Chicago, October 14 to 18, 1929.

OSAGE COUNTY elected the following officers for 1929: J. G. Shoun, President; C. H. Guild, Vice President; M. E. Rust, Secretary-Treasurer.

OKLAHOMA CITY ACADEMY OF MEDICINE elected President, Dr. L. M. Westfall; Secretary, Dr. T. G. Wails; Member of the Executive Board, Dr. L. J. Starry.

DR. FRANK McGREGOR, Mangum, was elected president of the State Hospital Association at the annual convention of the organization in Oklahoma City.

TULSA COUNTY MEDICAL SOCIETY elected the following officers for 1929: C. T. Hendershot, President; J. F. Gorrell, President-elect; Henry S. Browne, Vice President; Edna May Sippel, Secretary-Treasurer.

OKLAHOMA SOCIETY For Crippled Children reports for the year 3,735 patients were examined, 1,628 were hospitalized. Subscriptions and general receipts totaled $34,165.32 of which $8,811.81 was used for current expenses, the remainder for items designated by the subscriptions.

DURANT HOSPITAL STAFF was host to members of the Bryan County Medical Society November 27th, the occasion for a turkey dinner. Dr. D. Armstrong, Durant, read a paper on "Diseases of the Respiratory Tract." Dr. Chas F. Moore, Durant, read one on "Complications of Upper Respiratory Diseases."

STEPHENS COUNTY MEDICAL SOCIETY, at their November meeting, were guests of Drs. W. S. Ivy and J. L. Patterson. Dr. B. A. Hayes, Oklahoma City, delivered an address on "Hypertrophy of the Prostate." Drs. Geo. W. Stiles and C. H. Fauks representing the Federal Government on "Bovine Tuberculosis," also other infectious diseases among stock communicable to man.

DR. LEA A. RILEY, Oklahoma City, was selected by the University of Kansas, Extension Department, to represent Dr. McKinley of the University of Minnesota, who was absent on account of illness from the Kansas City meeting. Dr. Riely's work covered Diagnosis and Internal Medicine andwas given during the Thanksgiving week at Kansas City. It is very gratifying to see Oklahoma Medical School branching out in this very deserved manner.

SOUTHWESTERN OKLAHOMA MEDICAL ASSOCIATION met at the Jefferson Hotel, Atoka, Wednesday, December 12, 1928. The program for the meeting was as follows: Invocation, Rev. J. A. Parks, Pastor Methodist Church, Atoka; Welcome Address, Dr. J. S. Fulton, Atoka; Response to Welcome Address, Dr. L. S. Willour, McAlester; President's Address, Dr. T. H. McCarley, McAlester; Some Case Reports, Dr. L. C. Kuyrkendall, McAlester; Surgical Attention in Emergency Cases, Dr. H. Lee Farris, Tulsa; Diagnosis of Pulmonary Tuberculosis, Dr. J. T. Wharton, Durant; Heart Failure, Dr. A. B. Chase, Oklahoma City; Treatment of the Neuroses, Dr. M. S. Gregory, Oklahoma City.

OTTAWA COUNTY MEDICAL SOCIETY announces its Fifth Annual Game Dinner for December 14th, at Hotel Main, Miami. Arrangements were under charge of Drs. Burleigh DeTar, president, J. W. Craig, secretary, and a committee composed of Drs. G. Pinnell, F. L. Wormington and F. P. Helm. The program was one of artistic, literary and poetic attainment and accomplishment, invoking all members to get together, lay aside worries and misunderstandings and start the New Year with a clean bill of health. Its sentiments are those which may well be adopted by all county societies and members. Aside from an elaborate banquet, the literary and scientific offerings were of unusually high order and presented by experts in their respective fields. Apropos and fitting, in fact, it might have better preceded the banquet, was a paper by Dr. Geo. E. Kappenberger, Kansas City, on "Dietary Considerations in Certain Gastrointestinal Conditions," an address, "Lives of the Hunted" by Senator Gid Graham, Nowata, who has much to do with game conservation in Oklahoma. The subject, "Angling—A Sovereign Remedy for Tired Nerves," was offered by Honorable Thomas A. Latta, for many years the potent, pungent and powerful editorial writer for the Tulsa World, now editor of Latta's Fortnightly Review. "Some Triumphs of Modern Surgery," was the subject of a paper by Dr. Davy L. Garret, Tulsa surgeon.

DOCTOR ALFRED W. COLEMAN

Dr. A. W. Coleman, 72 years old, died suddenly November 16th, at his home in Davenport.

Dr. Coleman was born at Decatur, Ill., October 19th, 1856. He obtained his preliminary education at Decatur public school. He graduated from Denver Medical College in 1888.

Dr. Coleman is survived by his wife and two brothers and a sister. Funeral services were held November 17th at the Christian Church under the auspices of Davenport A. F. and A. M. lodge. Burial was in the old home cemetery at Denver, Colorado.

DOCTOR WALTER PHILIPS ROBINSON

Dr. W. P. Robinson, practicing at Sapulpa since 1918, died December 2nd, at the Lakeview Hospital, Danville, Illinois.

Dr. Robinson was born in Indiana and was educated in Louisville, Kentucky, graduating from the University of Louisville in 1905. He lived for a number of years at Boonville, Indiana, before going to camp as a surgeon during the world war.

Dr. Robinson was a member of the Rotary Club, a member of the Masonic lodge and the Elks Club. Burial was in Sapulpa. Dr. Robinson is survived by his wife and one son.

DOCTOR ZACHARIAH G. TAYLOR

Dr. Z. G. Taylor, Mounds, 77 years old, died December 2nd, after a long illness.

Dr. Taylor was born in Adair County, Kentucky, December 2nd, 1851. He has practiced medicine for 46 years, 23 years of this time being spent in Mounds. He is survived by his wife and two daughters. Funeral services were conducted December 3rd, by Rev. Tom F. Shaw, pastor of the Second Christian Church, Tulsa, and burial was in Mounds cemetery.

ORTHOPAEDIC SURGERY

Edited by Earl D. McBride, M. D.
717 North Robinson St., Oklahoma City

The American College of Surgeons.

The clinics in Boston at the 1928 meeting of the American College of Surgeons were of superior quality; especially were the orthopedic clinics exceptional in their instructiveness. Boston has more authorities in orthopedic surgery than any other city of its size and it is remarkable how these men cooperate in presenting their local surgical developments. Many of their clinics consisted of demonstrations of end results and no effort was made to hide the unfavorable results.

An especially interesting clinic was that held daily by the American Mutual Liability Company. Dr. Chas. Codman demonstrated his treatment of subacromial bursitis of the shoulder and his operation for suture of the subscapularis. He made the point that this muscle which covers the head of the humerus is more often torn than is generally thought and is the cause of permanent limitation of abduction of the shoulder following dislocations and fractures about this joint. Dr. Frederic Jay Cotton demonstrated some interesting cases of deformities following industrial fractures. He keeps fractures of the spine without paralysis, in bed for six weeks on a hyperextension frame. They may then be up in a cast or brace. In six months, exercise is allowed, and in nine months, ordinary labor is resumed. He does not favor spinal fusion operations on industrial cases.

Dr. Cotton is not enthusiastic about artorodesis operations in fractures of the os calcis. He does believe, however, that fractures of the astragalus should be reduced immediately by open operation and reduction of fragments.

In the treatment of tubercular joints, Dr. Robert Osgood demonstrated a chart made from an abundance of records at the Massachusetts General Hospital in which the frequency of tubercular joints in children had lessened progressively and rapidly within the last few years and expressed the opinion that this was due to strict milk inspection and early diagnosis by public health authorities.

Acute infantile paralysis is receiving a great deal of attention in Boston and a supply of convalescent serum is reported on hand by the Harvard Infantile Paralysis Commission. Dr. William Loyd Aycock gave a very instructive lecture at the Harvard Medical School upon this subject. If the diagnosis is made before paralysis occurs, the convalescent serum is very effective. He believes that the disease is present in childhood just as measles and other infectious diseases, but normal resistance become lowered and epidemics may follow.

Dr. Andrew MacAusland at the Carney Hospital held several very interesting clinics. Dr. MacAusland is very progressive and has accomplished some marvelous results in the construction of new joint.

We are grateful to Boston for its splendid teaching.

Talbot, J. A.: The Treatment of Anterior Poliomyelitis. Virginia M. Month., 1925, lii, 216.

In discussing the pathology of anterior poliomyelitis, the author emphasizes the general toxemia and the extreme primary paralysis from pressure. The condition has four stages: the stage of onset, a stationary period, the period of partial recovery, and the chronic stage.

The treatment varies according to the stage of the disease. In the acute stage, the patient should be placed at complete rest in order to protect the inflamed nerve cells from peripheral stimuli. For this purpose, the plaster bed or Bradford frame may be used.

The limbs should be immobilized to prevent contractures. Gentle massage should be given only after the acute tenderness has disappeared.

In the stage of convalescence, muscle training is indicated and massage should be continued. Weight-bearing may be allowed only with proper brace to prevent contractures and deformity from over-balance and muscle pull.

In the chronic stage, massage should be continued. It is in this period that the judicious use of apparatus is advisable and operations for stabilization and tendon transplantation may be indicated. Fatigue must be prevented.

In conclusion, the author cities instances of favorable results given by the Rosenow serum, but states that he has never used it.

Mitchell, J. I.: The Residual Paralysis and Deformity of Anterior Poliomyelitis. J. Bone and Joint Surg., 1925, vii, 619.

Anterior poliomyelitis is an infectious disease characterized by inflammation of the gray substance of the spinal cord and attended by motor paralysis and deformity.

The course of the condition may be divided into three stages: (1) the acute febrile stage occurring usually in infants or young children, (2) the stage of repair of the damaged cord and re-establishment of function during a period of months or years, and (3) the stage when improvement ceases and a permanent residual paralysis remains. The residual state of deformity may progress or become accentuated by growth.

The disease is of wide geographic distribution and often occurs in epidemics. New York and the New England states rank first as endemic foci.

Many problems pertaining to the pathological serological, bacteriological, and immunological study of the disease have been solved by animal experimentation. Flexner and Rosenow have shown by experiments that the infecting organism probably enter the body through the upper respiratory passages. Children whose tonsils have been removed are rarely affected during an epidemic of anterior poliomyelitis.

In the Mayo Clinic series of 350 patients, the disease occurred during the first three years of life in 44 per cent, but the ages range from 15 months to 59 years.

Trauma was given as the etiological factor in thirty-six cases. The prodromal symptoms were chiefly gastro-intestinal: loss of appetite, vomiting, constipation, and diarrhoea. Fever and pain were also prominent symptoms. In most cases, the paralysis appeared on the fourth day. In 37.5 per cent the initial involvement occurred in both legs.

Usually the patient does not seek aid until after the deformity has become well established. In the series of cases reviewed, the average duration of the paralysis is 8.4 years. The paralysis is usually more severe in the legs than in the arms, and certain muscles are affected more than others.

The anterior tibial muscle is most commonly paralyzed.

In the last stage of the disease, a limp was the the chief complaint of 44 per cent of the cases. The second most common complaint was deformity of the feet and legs. Talipes equinus and talipes valgus were the most common deformities. Scoliosis occurred in 31.4 per cent of the cases.

Marked improvement follow proper treatment early in the disease. The treatment usually consists inrest, the useof splints and brace, massage, the application of heat, and muscle training. In many cases, surgical treatment of the residual deformity is of great benefit. There are three types of operation: (1) those correcting deformities, (2) those stabilizing the limb as well as correcting deformities, and (3) those increasing the function of the limb.

DERMATOLOGY AND RADIOTHERAPY

Edited by C. P. Bondurant, M.D.
413 Medical Arts Building, Oklahoma City

Radiological or Operative Treatment of Cancer of the Uterus. J. Heyman, Actaradiol., 1927, viii, 363-409.

A sufficient number of cases have been submitted in various statistical reports concerning the treatment of cancer of the cervix to enable a comparison of the results of the two methods of treatment to be made with usual accuracy. Difficulties are met however in drawing these conclusions from such comparisons because of the fact that the results of operative treatment have been secured from an initial material, which was on the whole clinically far superior to that treated radiologically. Thus far the number of cases is still too small to permit any definite conclusions concerning the results in the treatment of operable cases of cancer of the cervix. In considering cancer of the cervix an endeavor has been made to collect all complete statistics from the world's literature pertaining to the end results of the extended operations. From this the highest average figures that can be taken as reasonably representative of the absolute in operation from statistics hitherto published is 20.2 per cent. The statistics from the Radiumhemmet include 500 cases of carcinoma of the cervix uteri treated radiologically in the first instance, and 41 not treated. The lowest figure for the absolute results in this group of cases is 20.7 per cent. In two-thirds of the operative statistics referred to the operable cases were 58.6 per cent or greater; in the group from the Radiumhemmet there were 26.6 per cent operable cases. With due consideration to the difference in initial material, it seems reasonable that the radiological treatment as practiced at the Radiumhemmet as regards end results in the treatment of cancer of the cervix is superior to the operative treatment. An accurate comparison cannot yet be made in the treatment of operable cases alone because the radiological statistics are yet too small. Figures so far available lend support to the theory that the operative treatment is to be preferred. The statistics of both the radiological and operative treatment of cancer of the uterine body are too small to furnish any comparison of much interest. Operative statistics show the absolute results to average 42.8 per cent of all the cases and 58.8 of the operable cases. The statistics from Radiumhemmet include 46 cases with an absolute result from radiological treatment of 43.5 per cent, and among the cases classed as operable the per cent of recovery was 60.0. These figures seem to indicate that the same results can be attained with either the radiological or surgical treatment.

Carcinoma of the Cervix Uteri. Karl H. Martzloff, Bulletin of the Johns Hopkins Hospital. 40:188-191, March, 1927.

The following is taken from the summary of this bulletin. Primarily this study was intended to ascertain if possible the factors that influence an operative cure of a patient suffering with cancer of the cervix uteri provided she survived the immediate effects of the operation. Certain features are briefly indicated upon which a prognosis may be based: first, extension or metastases when found in either regional lymph nodes, the adnexa, bladder, rectum, or pericervical tissue are considered to render an ultimate operative cure impossible; second, extension of the cancer to the uterine body impairs the chance of an operative cure but does not obviate it in spinal-cell cancers. In transitional cell type this extension renders operation worthless. Generalizations on these points are hardly permissible; third, extension to the vagina in otherwise operable patients warrants an unfavorable prognosis. This complication is most serious in the trensitional cell cancer and least serious in the adenocarcinomata; fourth, the duration of symptoms beyond eight months in the spinal and transitional cell cancers is sufficient to put the patient beyond the scope of operative cure; fifth, the degree of cervical involvement, provided no pericervical implication has occurred, is relatively unimportant in the spinal cell as well as in the adenocarcinomata. The transitional cell cancer involvement is an important role, so that of the cured patients those having one-third or less of the thickness of the cervix involved in cancer as compared with those having more extensive involvement are as two to one. Of patients with one-third of the cervix involved the operability incidence is 95 per cent and the cures obtained in this group are 57.8 per cent. It seems possible, on the basis of this study to render a prognosis provided the tissue removed is studied with sufficient care and the operation is performed by a trained surgeon.

Radiation Treatment of Malignancy of the Cervix by Radium Emanation. Ira I. Kaplan, Radiology, October, 1927, ix, 314-321.

At the Bellevue Hospital the following method of treating carcinoma of the cervix is used: first, the lesion is attacked locally to clear up infection, then the pelvis to block off the lymphatics and destroy the metastatic foci, and finally the local lesion. This is done with the idea of destroying the tumor and of administering sufficient doses in the proper time to give desired results. Before radiation is started the patient is treated from a nutritional and hygienic standpoint. The bowels are cleansed with enemas, douches with boric acid or 2 per cent glucose, and then followed by irrigation with 2 per cent methylene blue. A biopsy is then taken of the lesion. Deep X-ray therapy is used over the pelvis in all cases as follows: 200 kv., 4 ma., 30 to 50 cm., target distance, 0.5 mm. cu. and 1.0 mm. Al filter, 9x12 or 15x15 cm. portals. Usually two fields anteriorly and two posteriorly are treated. If the bladder shows involvement a central field is also treated

over the pubic area. The treatment is given in divided doses. A 25 per cent erythema dose is given alternately on anterior and posterior surfaces. This gives a depth dose of 60 to 75 per cent on the lesions. The radium treatment depends upon the histopathology, the amount of involvement and extension of the lesion and whether or not the uterine canal is open. The dosage varies from 4000 to 7000 mc-hr. 4500 mc-hr. is given when the lesion is limited to the cervix, half of the dose in the cervical canal and half in the vagina. This system of treatment has been found very successful during the two years it has been practiced in Bellevue Hospital.

The Management of Chronic Endocervicitis. C. Jeff Miller. Surg., Gynec. and Obst., March, 1928, vlvi, 337-340.

Endocervicitis is an infectious disease which does not tend to cure spontaneously and the sequelae of which may lead to grave disorders. Every case therefore should have prompt treatment. The underlying pathology should receive the main consideration rather than the manifestations of the disease and this pathology cannot be clearly realized without a clear understanding of the histology of the cervix and the lymphatic circulation of the pelvis. Local treatment is very unsatisfactory and diathermy, ionization, etc., give only partially satisfactorily results and are by no means harmless. The routine application of radium is too dangerous to be employed but it gives excellent results in selected cases. This class of cases should include only those in which it can be definitely demonstrated that no active or latent infection of the tubes is present. This decision is not an easy one even to an expert. A large number of cases can be averted by proper prophylaxis especially following parturition. All surgical operations of the cervix should be avoided when possible and when in question any surgery on this part is best preceded by a preliminary course of treatment the object of which is to reduce hypertrophy, and inflammatory reactions and to restore normal relation of the parts.

The Roentgen and Radium Treatment of Gynecological Cancer. M. J. Memenow, C. J. Arnstamm and E. R. Nowotjelnowa. Fortschr. a. d. Geb. d. Roentgenstrahlem, 1927, xxxv, 989-990.

The authors have observed 1030 cases of cancer of the female genitals which were treated by X-rays and radium. The cases were distributed as follows: 658 cancers of the neck of the uterus, 50 of the body of the uterus, 14 of the vagina, 25 of the ovaries, 273 recurrences after war-time operations, 10 recurrences after removal of ovaries. The authors conclude from this material that in operable cases the radiation treatment is generally not inferior to the surgical and can be applied quite as satisfactorily as surgery. In all inoperable and borderline cases combined X-ray and radium should be pursued and applied by those specially trained; 10 per cent of inoperable cases were saved from apparently unavoidable death in this manner. This treatment can be considered as only palliative in hopeless cases. The authors never resort to curettage or removal of the tumor by the cautery because this experience has shown that these affect the final results unfavorably. Biopsy was practiced as a rule and treatment begun at once. Radium in the form of the bromide is applied, 25 to 50 mg. radium element previously filtered through 1 mm. brass or 2 mm. of platinum. Usually the 50 mg. dose is applied into the neck of the uterus or at some distance from the crater and allowed to remain in 24 to 48 hours. After eight days the radium treatment is repeated two to four times according to the case. In this manner the patient receives during a series 2500 to 4000 mg-hr. of radium. The radium should be removed immediately when temperature goes over 38 degrees. Severe tenesmus or complications in the bladder are also indications for removal. In the intervals between radium treatments the patient receives heavy deep X-ray treatments. The whole radiation series is repeated after two and one-half to three months and a third series may be given six months later.

EYE, EAR, NOSE and THROAT

Edited by Jas. C. Braswell, M. D.
726 Mayo Bldg., Tulsa

A Study of Radical Mastoids: White, L. E., Ann. Otol., Rhinol. and Laryngol., 1928, xxxvii, 419.

The author studied fifty-four cases in which the radical mastoid operation was done at the Massachusetts Eye and Ear Infirmary. In one-third of the cases a previous mastoid operation had been performed, and in about half of them a tonsil and adenoid operation had been done. The fundi and visuel fields were generally negative. In the operations only theKoerner flap was used and as a rule primary skin grafts were employed.

There were several severe postoperative complications. In one case traumatic facial paralysis developed but cleared up after nine months. Two of the operations were failures.

The importance of a close follow-up after radical operation on the mastoid is brought out by the fact that the poor results were attributed to neglect of the ear on the part of the patient and were corrected by proper treatment.

The Roentgenogram in Mastoid Disease: Taylor, H. K. Am. J. Roentgenol., 1928, xix, 522.

The author states that the roentgenogram has an established place in otological diagnosis. It furnishes information relative to the anatomy of the mastoid and shows variations from the accepted normal. As both mastoids of the same subject are usually similar in size and structure, one side may be compared with the other. The size and location of the cells as well as the degree of pneumatization as revealed in the roentgenogram may be of great value to the clinician. The author gives a detailed description of the anatomical landmarks revealed by roentgen examination.

Pathological changes in the mastoid manifest themselves by variations in density, the absorption of the bony trabeculae, and erosions of the tegmen and sinus wall. Slight variations in density do not necessarily indicate mastoid involvement as they may be produced by oedema or other conditions of the soft tissues adjacent to the mastoid. When marked clouding of the mastoid process is noted, the presence of an exudate and granulations within the cells is indicated. Extreme clouding usually means new bone formation or sclerosis. Changes in density may be localized or general. Thinning, absorption, and destruction of the intercellular septa are due to a pathological process within the mastoid bone. When the process has extended beyond the cells it may produce a solution of continuity in the sinus wall or changes in density in the region of the tegmen.

The author gives special consideration to conditions producing a non-destructive mastoiditis characted by a slight increase of density. He desdescribes in detail also the changes caused by a decharacterized by a slight increase of density. He structive process and those occurring in chronic otitic infections with sclerosis. He states that cholestentomata are manifested by destructive and productive changes indicated by dense linear shadows surrounding radiolucent shadows.

The article is supplemented by roentgenograms of the various conditions discussed.

Some Considerations of Vertigo Based on Experience: Mueller, I. Proc. Roy. Soc. Med., Lond., 1928, xxi, 1369.

In a discussion of vertigo, certain fundamental conceptions of space and time must be considered, and terms such as "organ of sense," "tonus," and "coordination" must be correctly defined and consistently employed.

Vertigo is the subjective feeling of uneasiness caused by the apparent staggering or rotation of surrounding objects or of movement of the ground and the sensation of falling or instability. There are two different forms of vertigo: the vertigo of touch and the vertigo of sight.

The "static organ" or "sixth sense" is the organ of equilibrium. Organs of sense are arrangements of the body able to receive adequate external and internal impulses and thransfer them to certain nerves.

The idea of space is the psychological result of complex views of the size, form, position and state of motion of the things around us. Depending upon the mode of perception, there are two kinds of space: the space perceived by touch and the space perceived by sight.

"Tonus" denotes a specific permanent tension and contractibility of the muscles which exist in normal cases independently of voluntary innervation. "Coordination" is the result of a harmonious cooperation of groups of muscles.

The ear is an anatomical, physiological, and psychological unit functioning simultaneously and constituting an effective mechanism for the protection of the body.

The author has discovered that vertigo, tinnitus, headache, and deafness can be influenced by means of electromagnetic tuning forks in different keys. The acoustic as well as the motor or static function can be stimulated or tranquilized by sound.

Volonskiascopy: Morsman, L. W. Am. J. Ophth., 1928, xi, 3 s. 433.

"Velonoskiascopy," the name given a new test for astigmatism devised by Trantas, means "viewing the needle shadow." Trantas, who is himself astigmatic, discovered that when he held a thin linear object before his uncorrected eye and looked at a chalk line on a blackboard, the object seemed to throw a shadow on the chalk line. He gives the following rules for his technique:

1. Refract the patient first as in the regular procedure.

2. Test the eye separately as in refraction.

3. Place the trial cross in the refraction frame (never a stationary frame such as the phoroptometer) with the arms of the cross in the principal meridians found during retinoscopy and other procedures.

4. Explain to the patient just what he is to look for and how to find it. As we are accustomed to focus vertical lines, tell the patient to find the vertical interval first and then, by moving the head slightly up and down, bring both into view.

5. Now add cylinders until the intervals are equal. The best technique consists in adding a minus cylinder with its axis on the broadest interval.

6. When the astigmatism is corrected, gradually reduce the amount of fogging sphere until the intervals due to diffusion circles disapper, and note if they remain equal to the last. The cylinder now in the frame represents the patient's astigmatism with its axis.

7. Lastly remember that this is a subjective test and its value depends upon the patient.

Errors may frequently be corrected by this procedure to 0.12 diopter. In the cases of less intelligent patients the test is doubtful and often worthless. In certain cases in which the findings or retinoscopy are doubtful but vision is normal it may prove to be the best method of finding the astigmatic error.

The Location of the Focus in Optic Nerve Disturbances from Infection: White, L. E. Ann. Otol., Rhinol, and Laryngol, 1928, xxxvii, 128

White says that early writers and even many of the writers of today have directed their attention almost exclusively to the adjacent sinuses in an attempt to locate the focus of infection causing optical neuritis. Whenever a patient with neuritis presents himself to an expert diagnostician there are certain lines of investigation that are almost universally followed. According to most investigators, among whom Rosenau occupies a conspicuous place, the teeth have most frequently been found to harbor the infecting focus. Tonsils are second in importance, while the sinuses are a poor third, possibly not even holding that position. The appendix, prostate, fallopian tubes, gall bladder, etc., also must be considered. A primary focus may have produced so many secondary foci that its elimination does not cure the neuritis. At present it is believed that the infection usually travels by way of the blood stream.

Gradle, in 1915, was one of the first to revolt against the prevailing theory that optic lesions of the inflammatory type result from the close relationship between the sinuses and the optic nerve. He believes that the anatomical relations of the sphenoid and ethmoid cells to the optic canal are immaterial when optic-nerve involvement in accessory sinus disease is considered.

White says that systemic infection and intoxication from a primary focus is usually haematogenous. The bacteria may be compared with emboli loosened from the place of origin and carried by the blood to the smallest blood vessels. The evolution of the anatomical lesions and the clinical phenomena aroused thereby are dependent on the type and virulence of the bacteria, the character of the tissue, and function of the organ involved. The specific tissue reaction consists of a local inflammation with endothelial proliferation of the lining of the blood vessel either with or without thrombosis, blocking of the blood vessels, hemorrhage into the immediate tissue, and positive chemotaxis with resulting multiplication of the leucocytes and plasma cells in the infected area or fibrinoplastic exudate with local connective-tissue over-growth.

Practically all types of neuritis, no matter whether they are of the ophthalmic, trifacial, auditory, or ulnar nerves, arise from some focus of infection. Except in malignant disease of the sphenoid the author has never seen a case in which there was thought to be direct extension from the sinuses to the optical nerve and he believes that the infection is always haematogenous. The sinuses have been considered only as one of several possible foci and then only as a minor possibility. White makes no efforts to find in them some mysterious infection that does not show on a radiographic plate. If transillumination and radiographs of the nasal cavities are negative he immediately looks elsewhere for a focus.

Apical abscesses are only one of several factors in dental infection. The author emphasizes the fact that dental films do not tell the whole story and that only the specialist in dental pathology is competent in diagnosing diseases of the teeth.

Dental foci of infection are among the most active agents that endanger bodily well being. Some authors go so far as to advocate the removal of all devitalized teeth while others try to differentiate between healthy and diseased teeth. White says, "Were I confronted with the solution of such a problem in a patient with serious optic-nerve disturbance in whom, after thorough investigation, nothing but devitalized teeth had been found, I would unhesitatingly advocate their removal." He is also of the opinion that pulpless teeth should be viewed with considerable concern.

When the teeth, after a thorough investigation, have been pronounced negative, the tonsils should be considered. It is not always possible before operation to determine whether or not the tonsils harbor infection. Special attention should be given to any enlargement of the glands below the angle of the jaw and to congestion and swelling about the soft palate and pillars, which usually indicate the presence of infection. If all other findings are negative, suspicious tonsils should be removed.

Of all the sinues the antrum is the commonest seat of infection. It may show only a thickening of the lining, but if this thickening is marked it is a definite indication of pathology even if no secretion is noted. Any sinus that shows evidence of definite infection should be drained and ventilated. In the author's experience ethmoid infection has been rare.

The author says that if "we concede that optic neuritis may arise from haematogenous infection, it logically follows that it may arise from any condition in the body that is capable of furnishing bacteria or their toxins to the blood stream."

It is practically always possible to determine the source of an infection and the focus should be eliminated unless the patient is in a weakened condition. If he is convalescing from influenza or has had some other debilitating disease, operative treatment may endanger his life. In such cases the intestinal tract should be kept healthy and the patient's general health built up so that he can combat the infection. Retrobulbar neuritis frequently develops in patients with low resistance.

The author gives a resume of 30 cases of optic nerve disturbances due to infection.

Otological Nystagmus: Quittner, S. S. Ohio State M. J., 1928, xxiv, 278. The Neurology of Nystagmus: Baumoel, S. Ohio State M. J., 1928, xxiv, 283.

Quittner discusses the more practical phases of otological nystagmus and its relationship to the peripheral organ. As a result of adequate irritation of the labyrinth the end nerve filaments receive stimuli through the fine hair which bends to the slighest motion of the endolymph. Certain definite physiological reactions, such as mystagmus, are obtained, depending upon which canal is irrigated the most. A nystagmus due to the vestibular apparatus is a distinct entity and must be distinguished from a non-labyrinthine type, which is characterized by an oscillatory or undulating nystagmus. Einstelling's nystagmus is also non-labyrinthine.

There are three degrees of labyrinthine nystagmus which may be caused by disturbance in the peripheral organ of the vestibular nerve, by disturbance of its central organ or ramifications, or by disturbance of the eighth nerve, or which may be induced by experimental methods. A spontaneous labryinthine nystagmus is diagnosed by means of the following signs: (1) dizziness which is always in a systematic direction, (2) a parallel association of the eyes, (3) some abnormal type of nystagmus, (4) inversion of a spontaneous nystagmus which indicates that it is a nystagmus of a non-labyrinthine nature.

The induced labyrinthine tests are described and discussed in detail together with some practical considerations. When a labyrinth has been destroyed, compensation or adjustment may occur and may be studied by means of the turning test.

Nystagmus in representative types of labyrinthitis and in non-suppurative diseases is also considered.

Baumoel outlines the neurological aspect of nystagmus. He says that vestibular nystagmus is a reflex movement of the eyeballs caused by stimulation of the vestibular apparatus. This reflex consists of an afferent path, a reflex center, and an efferent path. The afferent path is the vestibular nerve which ends in three distinct nuclei. One of these is Deiters' nucleus, which is regarded as the nystagmus center and which contains a separate center for each of the three forms of nystagmus. The fibers of the oculomotor nerve represent the efferent path in the nystagmus reflex arc.

The author discusses the mechanism of this vestibulo-ocular reflex and also of the vestibular nystagmus. He says that the normal function of the vestibulo-ocular reflex is to assure and regulate the tonic innervation of the conjugate eye muscles and that any disturbance in the vestibular apparatus causes an upset of this equilibrium and produces a nystagmus. The only structure capable of producing vestibular nystagmus are the labyrinth, the vestibular nerve, its nuclei in the medulla, the arcuate fibers and the posterior longitudinal bundle. Nystagmus may also be produced by a lesion which gives rise to an increased intracranial pressure or a diaschisis.

For practical purposes a labyrinthine nystagmus of great amplitude and long duration and not accompanied by dizziness is a central and not a peripheral labyrinthine nystagmus. The direction of falling in labyrinthine affections is dependent on the position of the head, but this is not so in the central affection.

Vertical nystagmus almost invariably points to the posterior fossa as the seat of trouble. While the combined horizontal-rotatory nystagmus is characteristic of affections of the labyrinth, it is caused by affections of the central vestibular system.

The responsible lesion can be determined by functional tests of the labyrinth and by continual observation of the nystagmus. In the differentiation between cerebellar and cerebral abscess nystagmus is an extremely valuable factor, as it is rare in the latter type. Diseases of the central nervous system not causing an increase in intracranial pressure will not affect experimental nystagmus if the reflex arc is intact. Increased intracranial pressure usually produces a hyperirritable labyrinth. A total loss of labyrinthine irritability is the result of a total destruction of the vestibular nuclei, of both posterior longitudinal bundles or of all the nuclei of the eye muscle nerves.

The Surgical Approach to the Ethmoid: Verge, C. A. J. Laryngol. and Otol., 1928, xliii, 266.

The author describes a new approach to the ethmoid which gives a clear binocular view of the diseased parts and affords the most efficient drainage possible. An incision three-quarter inch in length is made in the sulcus between the eyeball and the frontal ridge, to a point just above the inner canthus. This incision eventually exposes the floor of the frontal sinus, the lamina papyracea, the nasal process of the frontal bone, the lachrymal bone, and the frontal process of the maxilla. The floor of the frontal sinus is removed with part of the lachrymal bone and part of the frontal process of the maxilla. Infections of the frontal sinus is then dealt with. In the next step, the frontonasal duct is enlarged and a wide opening is made into the nose by cutting through the anterior ethmoid cells. By standing almost at the head of the table, the surgeon is able to obtain a good view for removal of the middle turbinal and posterior ethmoid cells. A rubber drainage tube is placed in the enlarged frontonasal duct and brought out at the anterior nares.

The average period of hospitalization is about nine days. Ultimately, the scar becomes practically invisible.

Verge has used the described technique in 26 cases without any fatalities and recommends the procedure for a more extensive trial in chronic cases of ethmoid suppuration.

The Use of Iodized Oil in the Diagnosis of Nasal Sinus Disease: Anderson, H., and MacDougal, C. Arch. Otolaryngol., 1928, vii, 340.

For the diagnosis of disease of the maxillary sinus, the authors introduce from 3 to 5 c. cm. of iodized oil into the sinus with a syringe after preliminary laverage with sterile water. The examination is then made by means of the fluoroscope and film. Partial filling of the sinus is advantageous during the examination under the fluoroscope because it permits separate flooding of the various angles and surfaces by manipulation of the head.

When the mucous membrane is uniformly swollen, as in acute sinusitis, the oil collects in a small pyramidal mass in the center of the sinus with a narrow extension reaching medially and upward toward the ostium. This mass is stationary when the head is moved.

In chronic disease, several different appearances may be exhibited, depending upon the nature of the pathological changes in the membrane. The thickness of the mucoperiosteum is determined by comparing the body margin with the oil margin. Polypi or abscesses within the mucous membrane are shown by filling defects.

When roentgenograms are to be made, sufficient oil must be introduced to cover the anterior wall when the face is down.

The article contains diagrams illustrating the action of the oil in a partially filled sinus and roentgenograms showing various filling defects.

BOOK REVIEWS

THE ELEMENTS OF THE SCIENCE OF NUTRITION, by Graham Lusk. Ph. D., Sc. D., Professor of Physiology at the Cornell University, Medical College, New York City. Fourth edition, reset. Octavo of 844 pages. Philadelphia and London: W. B. Saunders Company, 1928. Cloth $7.00 net.

ADDRESS ON SURGICAL SUBJECTS, by Sir Berkeley Moynihan, Bart., President of the Royal College of Surgeons of England. Octavo of 348 pages, illustrated. Philadelphia and London: W. B. Saunders Company, 1928. Cloth, $6.00 net.

Moynihan is one of the most authoritative writers in the medical profession today. A profound and keep observer ,aremarkable lecturer and successful speaker. His writings probably have more appeal than any living physician. This volume consists of 14 addresses. Those of great interest are "Acute Pancreatitis," "The Gall Bladder and its Infections," "Perforation of Gastric and Duodenal Ulcers," and "The Approach to Surgery."

THE SURGICAL CLINICS OF NORTH AMERICA (Issued serially, one number every other month). Volume 8, number 5. (New York Number, October, 1928), 293 pages with 141 illustrations. Per Clinical year (February, 1928, to December, 1928). Paper, $12.00; Cloth, $16.00. Philadelphia and London.

The leading article in this issue and certainly one which should be studied by the surgeon and internist is "Acute Appendictitis With Reference to the Advances in Treatment During the Last Ten Years and the Possible Progress for the Ensuing Ten Years," by Frederic W. Bancroft.

Dr. Bancroft points out the following significant facts:

1. Increasing ability of doctors to early diagnose and to refer patients for operation.
2. Improved anesthesia.
3. The use of the Levin tube.
4. Improved drainage in Peritonitic cases.
5. Hypertonic salinfileus and repeated transfusions for sepsis.

All of these together have greatly lessened mortality. Early jejunostomy is mentioned; in the writer's opinion it is not stressed sufficiently as of remarkable life saving value in certain cases. Inasmuch as we have had nothing otherwise worth while to offer "Intravenous Injections of Gentian-Violet in the Treatment of Phlebitis," by M. Stanley Brown will prove of interest to those having these difficult cases to treat.

"The Radical Operative Cure of Gastric Duodenal Ulcer" is presented by Professor A. A. Berg. Berg believes in subtotal gastrectomy as the best means if surgical intervention is decided; gastroenterostomy does not find favor with this authority.

REGIONAL ANESTHESIA, by Gaston Labat, M.D., Clinical Professor of Surgery, University and Bellevue Hospital Medical College, New York, Laureate of the Faculty of Science, University of Montpellier; Laureat of the Faculty of Medicine, University of Paris; formerly Special Lecturer on Regional Anesthesia; The Mayo Foundation, University of Minnesota. With a foreword by William J. Mayo, M..D.. Second edition, revised, Octavo of 567 pages with 367 original illustrations| Philadelphia and London: W. B. Saunders Company, 1928. Cloth, $7.50.

It is doubtful if anything has, within the past decade, so profundly affected surgery and is so far reaching importance as regional anesthesia. Even to physicians some phases of regional anesthesia, intraspinal for instance, when administered by the adept are truly spectacular. Its uses and applications are almost limitless. To the layman and the uninitiated physician there is something rather shocking and appalling incident to the invasion of the spinal column. As a matter of fact the writer believes that spinal anesthesia has been the means bf successfully affording hundreds of operations upon that type of patients who could hardly have possibly survived any other type of anesthesia. Certainly regional anesthesia in all its phases is here to stay and it will be found more and more in use as time goes on. Labat has given us a classic in his volume. Every surgeon should consult it.

NEUROLOGICAL EXAMINATION. An exposition of tests with interpretation of signs and symptoms, by Charles A. McKendree, M.D., Associate, Department of Neurology, College of Physicians and Surgeons, Columbia University. With a foreword by Henry Alsop Riley, M.D. 12 mo of 280 pages with 88 illustrations. Philadelphia and London: W. B. Saunders Company, 1928. Cloth, $3.25 net.

This book is intended to familiarize the medical student and those interested in specializing with the systematic form of examination of the central nervous system. The positive requirement of most comprehensive examination in neurological cases is too well known to need discussion. This volume gives a complete outline of the work.

ESSENTIALS OF PRESCRIPTION WRITING —By Cary Eggleston, M.D., Assistant Professor of Clinical Medicine, Cornell University, Medical School. Fourth Edition, revised; 16 mo. of 153 pages. Philadelphia and London: W. B. Saunders Co., 1928. Cloth, $1.50 net.

A TEXT BOOK OF SURGERY—By W. Wayne Babcock, M.D., F.A.C.S., Professor of Surgery and of Clinical Surgery in the Temple University, Philadelphia; Surgeon to the Samaritan Hospital and to theAmerican Hospital for Diseases of the Stomach. Octavo of 1467 pages with 1050 illustrations, nine of them in colors. Philadelphia and London: W. B. Saunders Co., 1928. Cloth, $10.00 net.

This very complete work on general surgery, divided into 58 chapters, has four general subdivisions concerned with General Surgery, The Surgery of Systems, Surgical Technic and Regional Surgery. Perhaps Dr. Babcock is best known to the American profession as master of the fine art of intrapsinal anesthesia, his case records upon this type running into many thousands, and his successes bordering upon the marvelous, to the unitiated seemingly impossible of performance, Therefore, the sections devoted to Regional Anesthesia in its various applications are more than passingly interesting. Throughout the work is extremely practical, based upon standardized procedures of today, which the author states, he may be ready to abandon tomorrow upon the perfection of better processes in the science of surgery, which he recognizes as a constantly changing and progressive science.

SYPHILITIC THERAPY

The Journal of Chemotherapy for October (Volume V, No. 3), contains an interesting article on "The Chemotherapy and Biologic Therapy of Malignant Tumors" by Dr. John A. Kolmer. There are, also, articles on "The Chemotherapy of Protozoan Infections Other Than Syphilis", "Syphilitic Therapy", and "Liver Treatment in Secondary Anemia", also, "New Views on Chemotherapy of Cancers", editorials, abstracts, and therapeutic news.

This quarterly journal will be sent gratis to physicians interested in Chemotherapy, research and the treatment of syphilis. For copies address the Dermatological Research Laboratories, 1720 Lombard Street, Philadelphia, or the Abbott Laboratories, North Chicago, Ill.

COUNCIL ACCEPTS OPTOCHIN

In compliance with the request of the Council on Pharmacy and Chemistry the name "Numoquin" has been changed to Optochin."

Optochin is used not only in the treatment of pneumonia but also in such conditions as pneumococcic meningitis and pneumococcic serpiginous ulcers. In the treatment of pneumonia it is administered by mouth.

The theory upon which the treatment of pneumonia with optochin base is founded has evolved from the results obtained by a large number of investigators, and is outlined as follows:

The maximum bactericidal power of the remedy must be maintained continuously for a definite period—1 to 3 days—employing the minimum quantity of the remedy necessary for the purpose. It was found in practice that, provided optochin base is used, and given in doses of 4 grains every 5 hours, day and night, and further, provided the treatment is begun within 24 hours, or at least not later than the second day after the onset of the disease, the results are all that could be wished. The fever abates rapidly, the course of the disease is shortened and rendered milder, and the patients experience a sensation of euphoria, while the appetite and general condition improve.

The base is used because, being practically insoluble in water, it is but slowly taken up into the blood circulation. With every dose of optochin base about 5 ounces of milk are given. The milk prevents too rapid formation of the more soluble optochin hydrochloride by the action of the hydrochloric acid secreted and thus assists in maintaining a uniform optimum concentration of the remedy in the blood. No other food or drink is given during the three days' treatment.

NONTUBERCULOUS CHILD

It is one of the pediatrician's frequent experiences to have brought to him a child whom the mother has anxiously suspected of having tuberculosis of the lungs. In the great majority of cases her suspicions are unfounded clinically. Underweight and a run-down condition are clearly indications for investigation, according to Joseph Brennemann, Chicago (Journal A. M. A., Feb. 25, 1928). So-called underweight has no significance per se. Some children are "skinny" because they are active, and active because they are "skinny"; others are phlegmatic because they are fat or fat because they are phlegmatic. There is no reason in health, other things being equal, why one should be converted into the other or why the two should be brought to a common artificially determined medium. It cannot be emphasized too strongly that a normal weight and an apparently normal state of nutrition do not exclude tuberculosis. A persistent cough evidently requires careful investigation. The story of frequent attacks of coughs over a period of years, Brennemann says, would cause him to lean away from a diagnosis of tuberculosis rather than toward it. A chronic tuberculous cough would be more apt to be continuous, not widely intermittent, and in a child would moreover almost surely be accompanied by fever, fatigue, pallor, localized fine rales, suppressed breathing or other lung conditions, all of which are regularly absent in the type of case considered. The presence of a foreign body sometimes offers greater difficulties in this connection. The neglected case with a chronic cough, and localized moist lung conditions, often lasting for many years, can easily be confused with tuberculosis. In such cases the foreign body moves freely, is metallic in nature and can easily be found with the roentgen ray, and its removal even after many years leads to a prompt cure. A still more frequent cause of anxiety to the parents is a persistent low-grade temperature. In Brennemann's experience a fairly persistent temperature of 99 to 99.5 and even occasionally 100 is many times more frequently due to some other condition than it is to tuberculosis. Such temperatures frequently occur after upper respiratory tract infections. If, however, the temperature goes to 101, even on rare occasions, or if the child has a positive Pirquet reaction, the child should be put to bed as a sick child and a diligent search made for the underlying pathologic condition with a real interest in the possibility of a tuberculous infection. A further cause for worry is the child that has had pneumonia and now after weeks, perhaps months, still has a fever and pathologic changes in the lungs. Has he a tuberculosis or an unresolved pneumonia? If there was a frank pneumonia in a previously healthy child the chances are all in favor of an unresolved pneumonia. If the beginning was insidious and the date of onset not well marked, if the temperature was never over 101 or 102, or if there was a decided pleuritic pain, one more strongly suspects tuberculosis. A serous pleural effusion makes it almost positive. In the author's experience, if a healthy child has had a definite pneumonia at the onset, the fever and physical condition that persists often enough for weeks and even months will eventually clear up and are practically never due to a superimposed tuberculosis. There is one chest condition due to tuberculosis in which the roentgenologist can readily make the diagnosis from his film, and the physician cannot with certainty clinically, because of the absence of all physical signs, i. e., a miliary tuberculosis or rather an early miliary tuberculous bronchopneumonia, especially in the baby. But even here there is room for caution. Fortunately the idea no longer persists that tuberculosis is rare at the extremes of life. The younger the individual, the younger the child, the younger the baby, the greater the danger of contagion, and the new-born baby should be guarded against tuberculosis as against the seven plagues. If Brennemann can avoid it, he will never allow a new-born baby to live in the same house with its own mother, or with any one else, that has any suspicion of an open tuberculosis. An open or suspected open tuberculosis is an absolute contraindication to nursing. The baby that has been exposed even for a short time to an open tuberculosis, and the older child that has been seriously exposed should be considered tuberculous and so far as possible, treated as such no matter what the present state of health may be. The grandfather, who lives with the family, who has coughed for years with an assumed "old man's cough," is not infrequent cause of contagion to the grandchildren.

INTENSIVE POSTURAL REST IN TREATMENT OF PULMONARY TUBERCULOSIS

W. A. Gekler and B. J. Weigel, Albuquerque, N. M. (Journal A. M. A., Feb. 25, 1928), believe that in intensive postural rest as they use it they have a method of treatment of pulmonary phthisis that deserves to rank with artificial pneumothorax and thoracoplasty in value and effectiveness. It is applicable in a wider range of cases. Complications are no more frequent and certainly less dangerous than with pneumothorax and thoracoplasty. When results are not obtained, pneumothorax or thoracoplasty may still be used. They see striking benefits, i. e., the maximum amount of healing possible in view of the nature and extent of the lesion, in fully one-fourth of their cases, and in another fourth there is considerable improvement. When clinical cures are obtained with postural rest, they are just as enduring as with any other form of treatment.

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